Vol. 1069 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

August 5, 1986

U.S.
DEPARTMENT
OF COMMERCE

Patent
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 5, 1986 Volume 1069 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Mar. 31, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Aug. 9, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,397,043 through 4,398,304
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 18, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,329,742	06/218,915	5/18/82
4,329,754	06/216,445	5/18/82
4,329,855	06/234,798	5/18/82
4,329,936	06/218,385	5/18/82
4,329,942	06/235,047	5/18/82
4,330,018	06/224,735	5/18/82
4,330,073	06/218,058	5/18/82
4,330,118	06/240,883	5/18/82
4,330,127	06/239,768	5/18/82
4,330,257	06/237,678	5/18/82
4,330,271	06/224,383	5/18/82
4,330,341	06/230,319	5/18/82
4,330,351	06/223,988	5/18/82
4,330,399	06/222,158	5/18/82
4,330,417	06/287,893	5/18/82
4,330,428	06/268,802	5/18/82
4,330,509	06/266,225	5/18/82
4,330,520	06/217,541	5/18/82
4,330,536	06/237,238	5/18/82
4,330,540	06/230,043	5/18/82
4,330,570	06/257,028	5/18/82
4,330,580	06/255,891	5/18/82
4,330,583	06/231,857	5/18/82
4,330,615	06/247,606	5/18/82
4,330,632	06/219,689	5/18/82
4,330,638	06/237,744	5/18/82
4,330,642	06/245,578	5/18/82
4,330,653	06/228,137	5/18/82
4,330,664	06/258,124	5/18/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,419,301, Re. S.N. 830,291, Filed Dec. 12, 1985, Cl. 261/118, METHOD AND APPARATUS FOR TREATING FLUENT MATERIALS, John E. Nahra, Owner of Record: *Dasi Industries, Inc., Washington, D.C.,* Attorney or Agent: Roland T. Bryan, Ex. Gp.: 135

4,434,959, Re. S.N. 837,703, Filed Mar. 6, 1986, Cl. 244/215, AIRFOIL FLAP ASSEMBLY WITH FLAP TRACK MEMBER, Peter K. C. Rudolph, Owner of Record: *Boeing Co., Seattle, Wash.,* Attorney or Agent: Robert B. Hughes, Ex. Gp.: 315

4,463,107, Re. S.N. 808,268, Filed Dec. 12, 1985, Cl. 521/137, POLYMER/POLYOL COMPOSITIONS HAVING IMPROVED COMBUSTION RESISTANCE, Donald W. Simroth, et al., Owner of Record: *Union Carbide Corp., Danbury, Conn.,* Attorney or Agent: Eugene C. Trautlein, et al., Ex. Gp.: 153

4,541,877, Re. S.N. 854,125, Filed Apr. 21, 1986, Cl. 148/101, METHOD OF PRODUCING HIGH PERFORMANCE PERMANENT MAGNETS, Hans H. Stadelmaier, et al., Owner of Record: *North Carolina State University, Raleigh, N.C.,* Attorney or Agent: Floyd A. Gibson, Ex. Gp.: 111

4,569,692, Re. S.N. 863,655, Filed May 15, 1986, Cl. 75/235, LOW THERMAL EXPANSIVITY AND HIGH THERMAL CONDUCTIVITY SUBSTRATE, Sheldon H. Butt, Owner of Record: *Olin Corp., New Haven, Conn.,* Attorney or Agent: Howard M. Cohn, et al., Ex. Gp.: 223

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,540,070, Reexam. No. 90/001,043, Requested: June 27, 1986, Cl. 15/83, PIVOTABLE SECTION FOR BOTTOM OF HOPPER ON SWEEPING MACHINE, Neil F. Brown, Owner of Record: *G. H. Tennant Co., Minneapolis, Minn.,* Attorney or Agent: R. D. Langford, Ex. Gp.: 240, Requester: Hako Minuteman, Inc., Chicago, Ill.

3,820,178, Reexam. No. 90/001,031, Requested: June 11, 1986, Cl. 441/111, SWIMMING AIDS, Mona L. Bentley, Owner of Record: *M. Bentley Belts Ltd., Johannesburg, S. Africa,* Attorney or Agent: Robert J. Patch, Ex. Gp.: 310, Requester: Lyon & Lyon, Los Angeles, Calif.

4,004,892, Reexam. No. 90/001,034, Requested: June 17, 1986, Cl. 428/652, COOKWARE FABRICATED FROM COMPOSITES OF COPPER, ALUMINUM AND STAINLESS STEEL, John B. Ulam, Owner of Record: *Clad Metals, Inc., Canonsberg, Pa.,* Attorney or Agent: Buell, Ziesenheim, et al., Ex. Gp.: 110, Requester: Pechiney, Boite Postale 787–08, rue Balzac, 75008 Paris Cedex 08, France

4,039,228, Reexam. No. 90/001,039, Requested: June 19, 1986, Cl. 384/312, TILTING PAD BEARING, John Repose, Owner of Record: *DeLaval Turbine, Inc., Trenton, N.J.,* Attorney or Agent: Hopgood, Calimafde, et al., Ex. Gp.: 240, Requester: Owner

4,048,654, Reexam. No. 90/001,040, Requested: June 20, 1986, Cl. 358/144, STEREOPHONIC TELEVISION SOUND TRANSMISSION SYSTEM, Carl R. Wegner, Owner of Record: *Telesonics, Inc.,* Attorney or Agent: Eugene M. Cummings, Ex. Gp.: 260, Requester: Zenith Electronics Corp., Glenview, Ill.

4,056,375, Reexam. No. 90/001,035, Requested: June 19, 1986, Cl. 55/381, GAS FILTER ELEMENT, Wolfgang Ringel, et al., Owner of Record: *Firma Carl Freudenberg, Weinheim, West Germany,* Attorney or Agent: Felfe & Lynch, Ex. Gp.: 130, Requester: Owner

4,058,998, Reexam. No. 90/001,033, Requested: June 17, 1986, Cl. 72/84, CONTAINERS, Jozel T. Franek, et al., Owner of Record: *Metal Box Ltd., Reading, England,* Attorney or Agent: Ronald St. Onge., Ex. Gp.: 320, Requester: Owner

4,200,703, Reexam. No. 90/001,036, Requested: June 20, 1986, Cl. 525/357, PROCESS FOR THE MANUFACTURE OF HEAT-STABLE NUCLEAR-BROMINATED POLYSTYRENES, Klaus Diebel, et al., Owner of Record: *Chemische Werke Huels, A.G., Marl, Germany,* Attorney or Agent: Millen & White, Ex. Gp.: 150, Requester: Owner

4,328,257, Reexam. No. 90/001,030, Requested: June 9, 1986, Cl. 427/34, SYSTEM AND METHOD FOR PLASMA COATING, Erich Muehlberger, et al., Owner of Record: *Electro-Plasma, Inc., Irvine, Calif.,* Attorney or Agent: Fraser & Bogucki, Ex. Gp.: 150, Requester: Vidas & Arrett, Minneapolis, Minn.

4,346,427, Reexam. No. 90/001,037, Requested: June 20, 1986, Cl. 361/173, CONTROL DEVICE RESPONSIVE TO INFRARED RADIATION, Kitson Blissett, et al., Owner of Record: *Blissett, Dunbar, et al., Swampscott, Mass.,* Attorney or Agent: Gerard F. Dunne, Ex. Gp.: 260, Requester: Robin, Blecker, et al., New York, N.Y.

4,381,331, Reexam. No. 90/001,038, Requested: June 23, 1986, Cl. 428/224, NON-STICKING PLY END TURN-OVER BLADDER AND METHOD OF MANUFACTURE THEREOF, James L. Johnson, Owner of Record: *McCreary Tire & Rubber Co., Indiana, Pa.,* Attorney or Agent: Walter J. Blenko, Ex. Gp.: 150, Requester: Owner

4,451,524, Reexam. No. 90/001,041, Requested: June 23, 1986, Cl. 428/213, POLYPROPYLENE STRAP AND METHOD OF MANUFACTURING THE SAME, Hiroyuki Matsumoto, Owner of Record: *Tsukasa Kasei Kabushiki, Tokyo, Japan,* Attorney or Agent: Oblon, Fisher, et al., Ex. Gp.: 150, Requester: Signode Corp., Glenview, Ill.

4,503,007, Reexam. No. 90/001,042, Requested: June 23, 1986, Cl. 264/210, POLYPROPYLENE STRAP AND METHOD OF MANUFACTURING THE SAME, Hiroyuki Matsumoto, Owner of Record: *Tsukasa Kasei Kabushiki, Tokyo, Japan,* Attorney or Agent: Oblon, Fisher, et al., Ex. Gp.: 150, Requester: Signode Corp., Glenview, Ill.

4,551,331, Reexam. No. 90/001,032, Requested: May 21, 1986, Cl. 424/195, EASILY DISPERSIBLE DIETARY FIBER PRODUCT AND METHOD FOR PRODUCING THE SAME, Richard E. Rudin, Owner of Record: *S. C. Johnson Co. & Son, Inc., Racine, Wis.,* Attorney or Agent: P. Dept. for S. C. Johnson & Son, Ex. Gp.: 120, Requester: Schering-Plough Corp., Madison, N.J.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Gamon -Calmet Industries, Inc., Newark, N.J., Reg. No. 502,456, for the mark "WATCH DOG", Canc. No. 15,371.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Aug. 5, 1986

PLT. 5,720	4,545,684	4,570,912	4,579,980
Re. 32,079	4,546,392	4,570,913	4,580,245
D. 280,556	4,548,024	4,571,232	4,581,190
D. 280,557	4,548,120	4,571,295	4,581,235
D. 281,116	4,548,210	4,571,357	4,581,283
4,162,959	4,549,376	4,571,401	4,581,360
4,310,343	4,550,479	4,571,648	4,581,661
4,315,934	4,551,328	4,571,737	4,581,697
4,373,048	4,551,464	4,572,130	4,582,281
4,385,074	4,551,683	4,572,666	4,582,569
4,409,326	4,551,988	4,572,675	4,582,699
4,423,223	4,552,697	4,572,732	4,582,761
4,424,401	4,553,102	4,572,788	4,582,787
4,432,453	4,553,237	4,572,959	4,582,933
4,445,164	4,553,245	4,573,145	4,582,958
4,447,445	4,554,218	4,573,382	4,582,982
4,456,709	4,554,313	4,573,434	4,583,535
4,462,864	4,555,258	4,573,706	4,583,758
4,463,089	4,555,622	4,574,295	4,583,814
4,464,497	4,555,868	4,574,335	4,583,900
4,467,437	4,556,700	4,574,828	4,583,902
4,469,565	4,557,181	4,575,134	4,583,969
4,471,044	4,558,010	4,575,467	4,584,016
4,473,461	4,559,200	4,575,482	4,584,021
4,475,965	4,560,008	4,575,946	4,584,216
4,492,073	4,561,249	4,576,117	4,584,596
4,494,531	4,561,390	4,576,200	4,584,812
4,495,700	4,561,754	4,576,370	4,585,065
4,497,772	4,562,148	4,576,802	4,585,377
4,503,183	4,562,646	4,577,634	4,585,486
4,503,706	4,563,212	4,577,823	4,585,594
4,506,763	4,563,567	4,578,055	4,585,647
4,519,833	4,563,680	4,578,072	4,585,695
4,520,139	4,564,576	4,578,319	4,585,741
4,520,742	4,565,467	4,578,448	4,585,743
4,522,735	4,565,504	4,578,534	4,585,772
4,526,958	4,565,553	4,578,691	4,585,935
4,528,661	4,565,678	4,578,772	4,586,314
4,530,891	4,566,072	4,578,776	4,586,428
4,531,004	4,566,715	4,578,861	4,586,430
4,537,373	4,566,851	4,579,019	4,586,672
4,538,682	4,566,947	4,579,240	4,586,676
4,538,738	4,566,981	4,579,260	4,586,905
4,542,382	4,567,594	4,579,638	4,587,121
4,542,449	4,568,614	4,579,658	4,587,337
4,544,464	4,569,459	4,579,714	4,587,431
4,544,666	4,569,749	4,579,751	4,588,338
4,544,923	4,569,833	4,579,820	4,588,889
4,545,111	4,569,927	4,579,890	4,589,129
4,545,431	4,570,701	4,579,924	4,589,762

Disclaimers

Des. No. 283,488.—*James T. Stevens,* San Antonio, Tex. PACKAGING CONTAINER FOR AN ELECTRICAL SWITCH. Patent dated Apr. 22, 1986. Disclaimer filed Apr. 11, 1986, by the assignee, *Power Controls Corp.*

The term of this patent subsequent to Dec. 3, 1999 has been disclaimed.

3,428,088.—*Frank W. Bell,* Avon, Ohio. FAUCET VALVE MIXING NOTCH. Patent dated Feb. 18, 1969. Disclaimer filed July 22, 1985, by the assignee, *Stanadyne, Inc.*

Hereby enters this disclaimer to claims 1–4 of said patent.

3,872,883.—*Donald L. Bianchetta,* Coal City and *Francis X. Hufeld,* Joliet, Ill. SPOOL-TYPE RELIEF VALVE. Patent dated Mar. 25, 1975. Disclaimer filed Jan. 11, 1985, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claim 1 of said patent.

3,916,963.—*Lawrence D. McIntosh,* Chicago, Ill. AUTOMATIC DRINK DISPENSER. Patent dated Nov. 4, 1975. Disclaimer filed May 14, 1986, by the assignee, *The Cornelius Co.*

Hereby enters this disclaimer to claims 7, 8 and 19 of said patent.

4,118,515.—*Gunter Rommele,* Riehen and *Ruth Hagemann,* Basle, Switzerland. PREPARATION OF A STABILIZED PAPAIN SOLUTION. Patent dated Oct. 3, 1978. Disclaimer filed Jan. 29, 1985, by the assignee, *Novo Industri A/S.*

Hereby disclaims the remaining term of said patent.

4,147,431.—*Joseph K. Mann,* Palo Alto, Calif. APPARATUS AND METHOD FOR MEASURING PRESSURES AND INDICATING LEAKS WITH OPTICAL ANALYSIS. Patent dated Apr. 3, 1979. Disclaimer filed May 23, 1986, by the assignee, *Varian Associates, Inc.*

Hereby enters this disclaimer to claims 1, 3, 5–19, 21 and 23–30 of said patent.

4,180,967.—*Aloys Greive,* Munster/Westfalen and *Aloys Horstmann,* Greven, Germany. CABLE-TWISTING TWO YARNS. Patent dated Jan. 1, 1980. Disclaimer filed Mar. 20, 1986, by the assignee, *Palitex Project-Co. GmbH.*

Hereby enters this disclaimer to the remaining term of said patent.

4,233,896.—*Paul H. Hamisch, Jr.,* Franklin, Ohio. LABEL PRINTING AND APPLYING APPARATUS. Patent dated Nov. 18, 1980. Disclaimer filed June 6, 1986, by the assignee, *Monarch Marking Systems, Inc.*

Hereby enters this disclaimer to claim 2 of said patent.

4,361,473.—*Chung Chang Young,* Natick, and *John P. Willis,* Sudbury, Mass. POTASSIUM ION-SELECTIVE MEMBRANE ELECTRODE. Patent dated Nov. 30, 1982. Disclaimer filed May 28, 1986, by the assignee, *Nova Biomedical Corp.*

Hereby enters this disclaimer to claims 12–14 of said patent.

4,439,760.—*James R. Fleming,* Indianapolis, Ind. METHOD AND APPARATUS FOR COMPILING THREE-DIMENSIONAL DIGITAL IMAGE INFORMATION. Patent dated Mar. 27, 1984. Disclaimer filed Dec. 9, 1985, by the assignee, *Bell Telephone Laboratories, Inc.*

Hereby enters this disclaimer to claims 1, 8, 10, 15, 16, 17 and 18 of said patent.

4,488,483.—*Yuji Kohara,* Tokyo, Japan. MULTICOLOR ROTARY PRINTING PRESS. Patent dated Dec. 18, 1984. Disclaimer filed Apr. 25, 1986, by the assignee, *Kabushiki Kaisha Tokyo Kikai Seisakusho.*

Hereby enters this disclaimer to all claims of said patent.

4,517,366.—*Ronnie R. Crenshaw,* Dewitt and *Aldo A. Algieri,* Fayetteville, N.Y. INTERMEDIATES FOR PREPARING 3,4-DIAMINO-1,2,5-THIADIAZOLES. Patent dated May 14, 1985. Disclaimer filed Nov. 20, 1985, by the assignee, *Bristol-Myers Co.*

Hereby enters this disclaimer to claim 6 of said patent.

4,526,911.—*Larry G. Boxall, William M. Buchta* and *Arthur V. Cooke,* Baltimore, *Dennis C. Nagle,* Catonsville, and *Douglas W. Townsend,* Glen Burnie, Md. ALUMINUM CELL CATHODE COATING COMPOSITION. Patent dated July 2, 1985. Disclaimer filed June 10, 1986, by the assignee, *Commonwealth Aluminum Corp.*

Hereby disclaims the term of this patent subsequent to Aug. 20, 2001.

4,533,211.—*Gary C. Bjorklund,* Los Altos, and *Glenn T. Sincerbox,* San Jose, Calif. FREQUENCY MULTIPLEXED OPTICAL SPATIAL FILTER BASED UPON PHOTOCHEMICAL HOLE BURNING. Patent dated Aug. 6, 1985. Disclaimer filed June 2, 1986, by the assignee, *International Business Machines Corp.*

Hereby enters this disclaimer to claims 1, 2, 4–6, 8 and 9 of said patent.

4,544,469.—*Larry G. Boxall, William M. Buchta* and *Arthur V. Cooke,* Baltimore, *Dennis C. Nagle,* Catonsville, and *Douglas W. Townsend,* Glen Burnie, Md. ALUMINUM CELL HAVING ALUMINUM WETTABLE CATHODE SURFACE. Patent dated Oct. 1, 1985. Disclaimer filed June 10, 1986, by the assignee, *Commonwealth Aluminum Corp.*

The term of this patent subsequent to Aug. 20, 2001 has been disclaimed.

4,573,081.—*Jereld R. Reeder,* Indianapolis, Ind. FREQUENCY SELECTIVE VIDEO SIGNAL COMPRESSION. Patent dated Feb. 25, 1986. Disclaimer filed Apr. 7, 1986, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1–10 of said patent.

4,585,590.—*Verlan H. Van Rheenen,* Portage, Mich. CYANOHYDRIN PROCESS. Patent dated Apr. 29, 1986. Disclaimer filed June 2, 1986, by the assignee, *The Upjohn Co.*

Hereby enters this disclaimer to claim 7 of said patent.

Dedications

Des. No. 244,462.—*Cleo D. Mathis,* South El Monte, Calif. WHIRLPOOL JET NOZZLE FOR BATHTUBS AND THE LIKE. Patent dated May 24, 1977. Dedication filed Dec. 18, 1981, by the *inventor.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,893,127.—*Michael Kaplan,* Princeton, N.J. ELECTRON BEAM RECORDING MEDIA. Patent dated July 1, 1975. Dedication filed Mar. 7, 1986, by the assignee, *RCA Corp.*

Hereby dedicates to the Public the remaining term of said patent.

4,569,364.—*George J. Keller, Laguna Miguel* and *Takashi Yanagi,* Monterey Park, Calif. VARIABLE FLOW SELF-CLEANING LIQUID DISTRIBUTION ELEMENT AND LIQUID DISTRIBUTION ASSEMBLY EMPLOYING A PLURALITY OF SUCH ELEMENTS. Patent dated Feb. 11, 1986. Dedication filed May 5, 1986, by the assignee, *Fractionation Research, Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimers and Dedications

4,475,550.—*Paul W. Bremer; Ross L. Bremer* and *P. Levon Pentecost,* Jacksonville, Fla. HALO FOR STEREOTAXIC APPLICATIONS. Patent dated Oct. 9, 1984. Disclaimer and Dedication filed May 23, 1986, by the assignee, *Bremer Orthopedics, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

4,571,187.—*Bernard Weissman,* New York, N.Y. DENTAL POST FOR RETENTION OF A PROSTHETIC SUPERSTRUCTURE. Patent dated Feb. 18, 1986. Disclaimer and Dedication filed June 4, 1986, by the assignee, *IPCO Corp.*

Hereby disclaims and dedicates to the Public claims 8, 16 and 19 through 23 of said patent.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 5, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-22-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	10-12-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-18-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	4-11-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	2-13-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-30-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-26-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-06-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-18-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-31-84
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-85

Expiration of patents: The patents within the range of numbers indicated below expire during June 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,452,362 to 3,458,862, inclusive

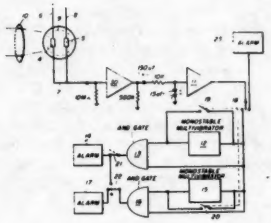
Plant Patents ..... Numbers 2,897 to 2,913 inclusive

REEXAMINATIONS

AUGUST 5, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,631,434 (544th)
PASSIVE INTRUSION DETECTOR
Frank Schwartz, Stamford, Conn., assignor to Barnes Engineering Company, Stamford, Conn.
Reexamination Request No. 90/000,785, May 17, 1985.
Reexamination Certificate for Patent No. 3,631,434, issued Dec. 28, 1971, Ser. No. 864,842, Oct. 8, 1969.
Continuation-in-part of Ser. No. 564,391, Jul. 11, 1966, abandoned. This application May 17, 1985, Ser. No. 864,842
Int. Cl.[4] G08B *13/18;* H01J *39/00*
U.S. Cl. 340—567



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–13** is confirmed.

1. A purely passive device for detection of moving intruders by self-radiation in the infrared, comprising in combination,

a. single stationary infrared-detecting system having two infrared-detecting elements connected in output opposition and located adjacent to each other in substantially the same plane,

b. a single, unitary stationary optical means for imaging a target onto the plane of the detecting elements whereby the image of the moving target in the field of view of the optics does not move unless the target does, in which case, however, the image of the target will move across one or both detecting elements.

c. electronic processing and amplifying circuits coupled to the output of the detecting elements and including a differentiating circuit, the differentiating circuit having a time constant so that it responds to frequencies relatively slow compared to low audio frequencies, whereby a target image moving slowly across at least one detecting element produces an output signal, and

d. alarm means actuated by said signal.

B1 3,716,065 (545th)
HAIRPIECE
Paul V. Finamore, Chicago, Ill., assignor to World of Wigs Mfg. Co. Inc., Chicago, Ill.
Reexamination Request No. 90/000,750, Apr. 1, 1985.
Reexamination Certificate for Patent No. 3,716,065, issued Feb. 13, 1973, Ser. No. 75,604, Sep. 25, 1970.
Filed Apr. 1, 1985, Ser. No. 75,604
Int. Cl.[4] A41G *5/00*
U.S. Cl. 132—53

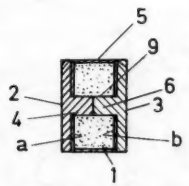
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **1** is confirmed.

1. A hairpiece comprising a first thin, flexible sheet member of premolded plastic material having a predetermined contour and peripheral dimensions conforming substantially with a given surface area of a user's head, a plurality of adjacently positioned hair strands extending from the outer surface of said sheet member so as to afford in the aggregate the appearance of natural hair, each strand comprising a given length having sections thereof penetrating said first sheet member at adjacently spaced intervals and extending outwardly from said sheet member, the intermediate portion of each of said strands underlying said first sheet member, said first flexible sheet

member providing the sole means from which the hair strands extend, adhesive means securing the intermediate portions of said strand in flush association with the undersurface of said first sheet member, a second relatively thin, flexible plastic sheet member preformed to the contour of the user's scalp and superimposing the intermediate strand portions, the outer margins of said first and second sheet members being stitched together and a plurality of adjacently spaced hair strands knotted to said margin and so disposed as to effectively conceal the aforesaid stitches.

B1 4,021,891 (546th)
MAGNETIC LOCK CLOSURE
Tamao Morita, Tokyo, Japan, assignor to Application Art Laboratories Co., Ltd., Tokyo, Japan
Reexamination Request No. 90/000,596, Jul. 20, 1984.
Reexamination Certificate for Patent No. 4,021,891, issued May 10, 1977, Ser. No. 462,174, Apr. 18, 1974.
Filed Jul. 20, 1984, Ser. No. 462,174
Int. Cl.[4] A44B *21/00, 17/00*
U.S. Cl. 24—303



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **5** and **6** are cancelled.

Claims **1–4**, **7** and **8** are determined to be patentable as amended.

1. A magnetic lock closure for use with handbags and similar containers comprising:

[magnetic] *a single permanent magnet* means for supplying magnetic attraction having a first side and a second side of opposite polarities and a hole therethrough between said two sides;

a first ferromagnetic [material means] *plate-shaped body* rigidly secured to said first side of said [magnetic] *magnet* means over said hole for centering the force of the magnetic attraction of said [magnetic] *magnet* means; [and]

a second ferromagnetic [material means] *plate-shaped body* removably positioned against said second side of said [magnetic] *magnet* means for contacting and being attracted to said first ferromagnetic [means] *plate-shaped body* through said hole, said second ferromagnetic [material means comprised of] *plate-shaped body formed as*:

a plate *means* adjacent said second side of said [magnetic] *magnet* means over said hole, and

a rod [the shape of said hole] *means extending from said plate means* rigidly [attached to said plate] *secured against substantial movement transverse to the plane of said plate means,* [extending through] *said rod means adapted to extend into* said hole and contacting said first ferromagnetic [material means] *plate-shaped body*, whereby said second ferromagnetic [material means] *plate-shaped body* is magnetically attracted and connected to said first ferromagnetic [material means] *plate-shaped body* through said hole[.]; *and*

a non-ferromagnetic cover having a central opening adapted to be substantially in register with said hole in said magnet means, said non-ferromagnetic cover superimposed at least over substantially the entire surface of said second side of said magnet means without substantially interfering with the magnetic attraction through said central opening, and to substantially protect the covered portion of said magnet means.

B1 4,302,440 (548th)

EASILY-SWALLOWED, POWDER-FREE AND GASTRIC-DISINTEGRABLE ASPIRIN TABLET THINLY-COATED WITH HYDROXYPROPYL METHYLCELLULOSE AND AQUEOUS SPRAY-COATING PREPARATION THEREOF

Phillip M. John, East Greenbush; Raymond J. Belanger, Rensselaer, and Myron Paikoff, Colonie, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Reexamination Request No. 90/000,831, Aug. 8, 1985.
Reexamination Certificate for Patent No. 4,302,440, issued Nov. 24, 1981, Ser. No. 174,249, Jul. 31, 1980.
Filed Aug. 8, 1985, Ser. No. 174,249
Int. Cl.[4] A61K *9/36*
U.S. Cl. 424—35

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **6**, **8**, **11**, **14**, **15**, **21** and **23** are cancelled.

Claims **1**, **2**, **10**, **12**, **13**, **16–20**, **22** and **24** are determined to be patentable as amended.

1. [The] *In a* method for preparing [an] *aspirin tablets coated with hydroxypropyl methylcelluiose,* [easily-swallowed, powder-free, gastric-disintegrable and thinly-coated aspirin tablet which does not have the characteristic aspirin taste and does not produce the esophageal discomfort of an uncoated aspirin tablet and which does not disintegrate in the stomach materially slower than the uncoated aspirin tablet,] *the uncoated tablets of which are relatively soft, fragile and whose surfaces and edges are easily damaged by the attrition encountered in conventional coating pans, which have not been specially treated or reformulated to increase hardness or durability to withstand breakage during film-coating manipulations and which have fine detail in embossed face designs and logos, the improvement* which comprises [aqueous spray-coating] *a one-step method, applicable for commercial production, of spraying a 2% to 15% by weight solution of* hydroxypropyl methylcellulose *in water containing about 15% to 25% w/w of glyceryl triacetate as plasticizer based on the weight of hydroxypropyl methylcellulose* onto all exterior surfaces of [an] *uncoated* aspirin [tablet] *tablets, which have been dedusted and preheated, to provide a slick shiny transparent film of hydroxypropyl methylcellulose with plasticizer without loss of fine detail in embossed face designs and logos, the resulting coated tablets being easily-swallowed, powder-free, gastric-disintegrable and thinly-coated, not having the characteristic aspirin taste, not producing the esophageal discomfort of uncoated aspirin tablets and not disintegrating in the stomach materially slower than the uncoated aspirin tablets,* the amount of hydroxypropyl methylcellulose being between 0.5 and 2.0 parts by weight per 100 parts by weight of the aspirin tablet.

B1 4,308,306 (547th)

FABRIC CONDITIONING PRODUCTS

Ernst Stähli, Olten, Switzerland, assignor to Lever Brothers Company, New York, N.Y.

Reexamination Request No. 90/000,699, Dec. 24, 1984.
Reexamination Certificate for Patent No. 4,308,306, issued Dec. 29, 1981, Ser. No. 168,236, Jul. 10, 1980.
Continuation of Ser. No. 940,090, Sep. 6, 1978, abandoned. This application Dec. 24, 1984, Ser. No. 168,236
Int. Cl.[4] B32B *3/00;* **D06N** *7/04*
U.S. Cl. 428—141

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentabiity of claims **4** and **5** is confirmed.

Claim **2** is cancelled.

Claims **1** and **3** are determined to be patentable as amended.

New claims **6** and **7** are added and determined to be patentable.

1. A fabric conditioning product for the conditioning of fabrics in a tumble dryer during the dryer cycle of a fabric laundering operation, said product comprising a substrate in flexible sheet form *having two opposite faces* and a layer of fabric conditioning formulation [on] *completely covering* at least one major surface *of at least one face* of the substrate, said layer having an exposed surface area and said layer including at least one region occupying between about 5% and about 50% of said exposed surface area, which region, before use of the product in a tumble dryer, has a reduced constant depth such that the layer presents a visually perceivable uneven surface of sharply defined configuration, *which provides a guide to the amount of formulation remaining on the product after use,* said fabric conditioning formulation having a softening point of between about 35° C. and about 80° C.

B1 4,351,172 (549th)

CYLINDER LOCK MECHANISM

Kaarlo Martikainen, Mastotie, Finland, assignor to Oy Wartisila AB, Helsinki, Finland

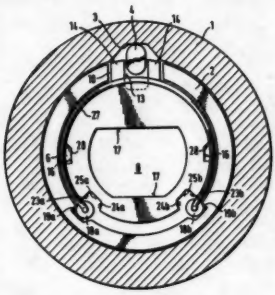
Reexamination Request No. 90/000,896, Oct. 31, 1985.
Reexamination Certificate for Patent No. 4,351,172, issued Sep. 28, 1982, Ser. No. 181,803, Aug. 27, 1980.
Filed Oct. 31, 1985, Ser. No. 181,803
Claims priority, application Finland, Sep. 7, 1979, 792797
Int. Cl.[4] E05B *29/02*
U.S. Cl. 70—366

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claims 2-22, dependent on an amended claim, are determined to be patentable.

1. A key operated cylinder lock including a hollow stationary cylinder housing enclosing a turnable power transmission element and a locking bar having a position locking the turning movement of said power transmission element relative to said cylinder housing, further a set of discs including a number of locking discs turnable by means of combination surfaces on a key of said lock, said locking discs being turnable, by the turning movement of said key, from an initial key insertion position to a releasing position, in which said power transmission element is released from its locked connection to the cylinder housing, the key of the lock being arranged to directly transmit a turning force to a number of locking discs only in a direction from said initial position to said releasing position, *one or several members turnable with the key in both directions* the returning of these locking discs to their initial position being arranged to be carried out by means of a separate return bar, receiving turning power from said key through *said* one or several members turning with key, said lock comprising means for guiding said return bar and said guiding means including



means for allowing said return bar to move in the circumferential as well as in the radial direction of said lock.

STATUTORY INVENTION REGISTRATIONS

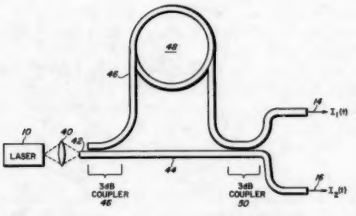
PUBLISHED AUGUST 5, 1986

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H96
INTENSITY MODULATED LIGHT SOURCE

Henry F. Taylor, Alexandria, Va., assignor to United States of America, Washington, D.C.

Filed Sep. 13, 1982, Ser. No. 417,826
Int. Cl.[4] H03K *13/02;* **G02B** *5/14, 5/174*
U.S. Cl. 332—7.51 **12 Claims**

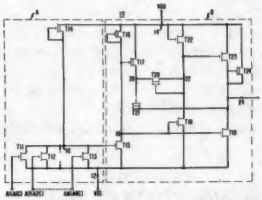


1. A device for producing intensity modulated light over a broad frequency range comprising:
- a frequency-tunable light source;
- a control line for varying the frequency of said light source with time in a desired manner such that light of a first frequency f_1 is provided by said light source at a first time and light of a second frequency f_2, different from said first frequency, is provided by said light source at a second time; and
- an interferometer with different optical path lengths disposed to receive said first frequency light from said light source and to interfere that light with said second frequency light emitted from said light source at said second time, resulting in an intensity modulated light signal at the beat frequency of $|f_1-f_2|$.

H97
ROW-ADDRESS-DECODER-DRIVER CIRCUIT

Kevin J. O'Connor, Center Valley, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 21, 1982, Ser. No. 451,786
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **15 Claims**



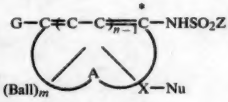
1. Circuitry comprising:
- a first inverter circuit having an input terminal and an output terminal;
- a second inverter circuit having an input terminal and an output terminal;
- a third inverter circuit having first and second input terminals and an output terminal;
- a first capacitor circuit means having first and second terminals;
- a potential setting circuit means coupled to the first terminal of the capacitor circuit means for selectively setting the potential thereof to a first preselected level;
- the input terminal of the first inverter circuit being coupled to a circuitry input terminal;
- the output terminal of the first inverter circuit being coupled to the input terminal of the second inverter circuit and to the first input terminal of the third inverter circuit;
- delay circuit means being coupled by a first terminal to the output terminal of the first inverter circuit and being coupled by a second terminal to the second terminal of the capacitor circuit means; and
- a coupling/decoupling switching device having a control terminal and first and second output terminals, the first output terminal thereof being coupled to the first terminal of the capacitor circuit means and the second output terminal thereof being coupled to the second input terminal of the third inverter circuit and to the output terminal of the second inverter circuit and the control terminal thereof being connected to a potential source that allows an increase in potential on the first terminal of the capacitor circuit means to be coupled to the second output terminal of the switching device, and wherein said second inverter includes a switching device (T22, T220) that is connected to the output terminal of said second inverter and to a voltage source (VDD) that tends to bias said coupling/decoupling switching device towards conduction.

H98
HEAT-DEVELOPABLE COLOR PHOTOGRAPHIC MATERIAL

Yoshiharu Yabuki; Kozo Sato; Shinsaku Fujita; Koichi Koyama; Hiroshi Hara, and Hideki Naito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 11, 1983, Ser. No. 540,737
Claims priority, application Japan, Oct. 8, 1982, 57-177148
Int. Cl.[4] G03C *1/40, 5/54*
U.S. Cl. 430—203 **44 Claims**

1. A heat-developable color photographic material, comprising:
- a support having thereon:
- a light-sensitive silver halide;
- a hydrophilic binder; and
- a dye releasing redox compound represented by the following general formula (I):



(I)

wherein G represents —OR^1 or —NHR^2; R^1 represents a hydrogen atom or a hydrolyzable group; R^2 represents a hydrogen atom or an alkyl group containing from 1 to 50 carbon atoms; Z represents an image forming dye group; A represents one or more carbon atoms nitrogen atoms, and/or oxygen atoms necessary for forming a substituted or unsubstituted aromatic ring; Ball represents an organic immobilizing group bound directly or through a linking group to the aromatic ring, and when two Ball groups

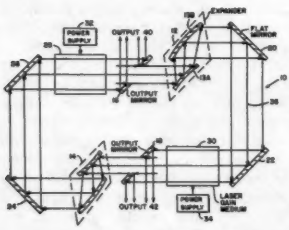
exist, they may be the same or different from each other; m represents an integer of 1 or 2; X represents a divalent organic group containing from 1 to 8 atoms and X with a nucleophilic group (Nu) is capable of forming a 5- to 12-membered ring together with an electrophilic center (the carbon atom marked with •) which is formed by oxidation; Nu represents a nucleophilic group; and n represents an integer of 1 or 2, said dye-releasing redox compound providing a color image of high density.

H99

MODULAR UNSTABLE RING RESONATOR WITH MULTIPLE OUTPUT COUPLERS

Robert W. Jones; Charles M. Cason, III, and James F. Perkins, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 24, 1984, Ser. No. 613,481
Int. Cl.[4] H01S *3/08, 3/081*
U.S. Cl. 372—108 **9 Claims**



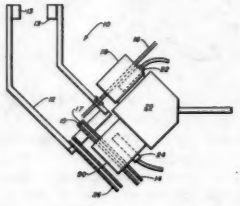
1. A modular unstable ring resonator consisting of: a plurality of beam turning mirrors, spaced apart and disposed for providing a circuitous optical path that forms the boundary of an area; a plurality of pairs of laser gain medium modules and beam expander modules, at least one pair of said plurality of pairs being disposed between adjacent ones of said beam turning mirrors in said optical path, and a plurality of beam output means for providing mutually coherent output beams, one of said beam output means being disposed between the laser gain medium module and beam expander module of each pair of said laser gain medium modules and beam expander modules.

H100

APPARATUS FOR NEBULIZING PARTICULATE LADEN SAMPLES OF LUBRICATING OILS

Medona B. Denton, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 445,401, Nov. 30, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 655,135
Int. Cl.[4] B05B *1/24*
U.S. Cl. 239—133 **4 Claims**



1. An oil nebulizer for nebulizing particulate laden samples of used lubricating oils of varying viscosity to provide uniform aerosols which are suitable for introduction into an inductively coupled plasma atomic emission spectrophotometer comprising:

a. a chamber having a first inlet means for receiving particulate laden used lubricating oils at a predetermined flow rate;

b. said chamber having a second inlet means for receiving gas at a predetermined flow rate and at a predetermined pressure;

c. said second inlet means being an enclosed hollow channel having means at one end for receiving said gas, the opposite end of said hollow channel having a restricted orifice opening through said opposite end in axial alignment with said hollow channel and a grove in alignment with said first inlet means intersecting said orifice; and

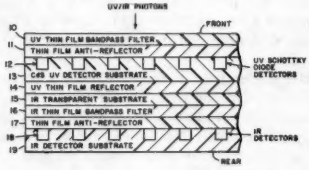
d. said first and second inlet means being positioned substantially at right angles to each other and said second inlet means being positioned substantially a forty-five degree angle to the horizontal so that oil from said first means will enter said vertical groove and flow in front of said orifice opening.

H101

ULTRAVIOLET AND INFRARED FOCAL PLACE ARRAY

Clifford G. Walker, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 1, 1984, Ser. No. 655,791
Int. Cl.[4] H01L *31/00*
U.S. Cl. 357—30 **1 Claim**



1. In a device comprising a plurality of first detectors arranged in a plane so as to constitute a first layer; said first detectors detecting a first band of radiation; a plurality of second detectors arranged in a plane so as to constitute a second layer; said second detectors detecting a second band of radiation; said first and second layers being arranged one on top of the other; said device senses radiation which flows through said first layer into said second layer; said plurality of first detectors being substantially transparent to said second band of radiation; said plurality of first and second detectors each constitute an array of detectors in its layer; a front end optics for focusing incoming radiation onto said first and second layers; said first band of radiation is ultraviolet; said second band of radiation is infrared; said plurality of first detectors are cadmium sulfide ultraviolet detectors arranged in a thin film substrate; and said plurality of second detectors are infrared detectors arranged in a thin film substrate.

H102

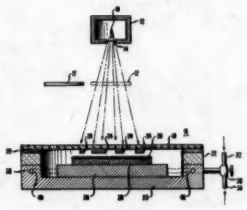
CONTROLLING RESOLUTION OF EXPOSED RESIST IN DEVICE LITHOGRAPHY

Michael Rubinstein, New Providence, and Vladimir Starov, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 9, 1984, Ser. No. 669,773
Int. Cl.[4] C03C *5/16*
U.S. Cl. 430—311 **17 Claims**

1. A method of making microminiature devices comprising the steps of

selectively irradiating a negative X-ray-sensitive-resist-coated workpiece with X-rays in a controlled atmosphere in which radiation-initiated laterally propagating cross-linking reactions continue in the resist even after radiation no longer impinges on the resist,



and, immediately after irradiation of the resist, quenching said laterally propagating reactions by exposing the just-irradiated resist to an atmosphere that contains at least 10 volume percent oxygen.

H103
NOVEL POLY(VINYLAZIDE)

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 14, 1985, Ser. No. 711,892
Int. Cl.[4] C08F *8/30;* C06B *45/10*
U.S. Cl. 525—331.5 **6 Claims**

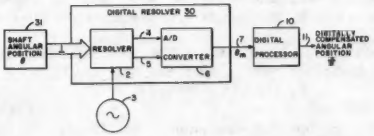
1. In an improved process of making poly(vinylazide) from poly(vinylchloride) and sodium azide, the improvement consisting of making said poly(vinylazide) acceptable for use in large caliber weapon systems by heating said poly(vinylazide) having the form of a gel in the presence of an excess of sodium azide with stirring at 60° C. for 24 hours, and then heating at 85° C. for 96 hours producing a poly(vinylazide) product containing between about 0.1 and 1.4 percent chlorine by weight.

5. Poly(vinylazide) having the formula—$(CH_2CHN_3)_6(CH_2CHCl)_4(CH{=}CH)_1$—.

H104
DIGITAL RESOLVER COMPENSATION TECHNIQUE

James C. Hung, and Stephen T. Hung, both of Knoxville, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 3, 1985, Ser. No. 740,695
Int. Cl.[4] H03M *1/00;* G05D *23/275;* G06G *7/19*
U.S. Cl. 340—347 SY **2 Claims**

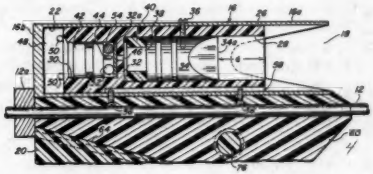


1. In a system utilizing a digital resolver for reading angular position and which has error outputs due to imperfection of the system, the improvement comprising a method of determining the error characteristics of the system, representing this error characteristic in a Fourier series and utilizing a compensation means attached to an output of the system for inserting said Fourier series therein to compensate for the errors of the digital resolver.

H105
LIGHTWEIGHT HYDRAULICALLY FIRED MINESWEEPING CUTTER

Paul F. Gould, and William A. Everritt, both of Panama City, Fla., assignors to The United States of America as represented by the secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1985, Ser. No. 751,831
Int. Cl.[4] B63B *9/03;* F42B *3/00*
U.S. Cl. 89—1.14 **4 Claims**



1. A mine mooring cable cutter device for use on a sweep wire, said device comprising:

a tubular metal cutter body defining a lumen closed at one end of the body and opening in a V-shaped recess at the other end that is engageable by a mooring cable;

an erecting vane formed of plastic material attached to and extending laterally from said body for holding said body in a predetermined attitude, said erecting vane comprising a vane element defining therein a longitudinal channel adapted to receive a sweep wire, a guide rail formed in said vane and having an angle of divergence relative to said channel, a generally triangular gate member slidably mounted on said guide rail for sliding movement therealong between open and closed positions relative to said channel, and latch means for releasably holding said gate member in said closed position;

a plastic barrel member carried in said body lumen and having an outer end portion exposed in said recess for engagement and movement by a mooring cable, said barrel member having an axial bore in said outer end portion;

a chisel disposed in said axial bore of said barrel member and having a cutting edge disposed a predetermined distance within said end portion;

explosive charge means disposed in said axial bore for propelling said chisel;

said barrel member being releasably held against movement relative to said body by a shear element so as to shear said element and move abruptly upon a predetermined force exerted on said barrel member by a mine mooring cable;

said chisel being releasably held against movement relative to said barrel member by a shear element so as to shear said element and move abruptly upon a predetermined force exerted on said chisel by said explosive charge, said barrel member having another axial bore in its inner end portion separated from the first mentioned axial bore by wall means;

a piston disposed in said other axial bore of said barrel member;

a firing pin mounted on said piston;

said barrel member, said piston and said closed end of said body defining a chamber;

an opening through said body member into said lumen for flooding said chamber with water prior to firing, said opening being closed by said barrel member upon said movement relative to said body so that water in said chamber acts on said piston to drive said firing pin through said wall means to fire said explosive charge solely by the force of said mooring cable acting against said barrel member, whereby said chisel is accelerated through said predetermined distance before impacting and severing said mooring cable without backing of said cable by anvil means.

H106
NOVEL ENERGETIC SULFATE SALTS AND A PROCESS FOR THEIR PREPARATION

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 21, 1985, Ser. No. 767,994
Int. Cl.[4] C06B *31/42*
U.S. Cl. 149—56 **32 Claims**

1. A novel 2,4,6-trinitrobenzene derivative containing R_1, R_2 and R_3 attachments in the 1,3 and 5-positions respectively wherein

(a) R_1 is a substituent selected from the group consisting of $-CH_2CH_2OSO_3NH_4$ and $-CH_2CH_2CH_2OSO_3NH_4$;

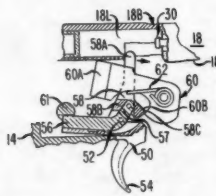
(b) R_2 is a substituent selected from the group consisting of $-H$, $-CH_3$, $-CH_2CH_3$, $-C(CH_3)_3$, $-CH(CH_3)_2$, $-CH_2Pi$, $-CH_2CH_2Pi$, $-CH_2CH_2OSO_3NH_4$ and $-CH_2CH_2CH_2OSO_3NH_4$ wherein Pi is an aryl, alkyl or alkylaryl group of up to about 12 carbon atoms and

(c) R_3 is a substituent selected from the group consisting of $-H$, $-CH_3$, $-CH_2CH_3$, $-C(CH_3)_3$, $-CH(CH_3)_2$, $-CH_2Pi$, $-CH_2CH_2Pi$, $-CH_2CH_2OSO_3NH_4$ and $-CH_2CH_2CH_2OSO_3NH_4$ wherein Pi is an aryl, alkyl or alkylaryl group of up to about 12 carbon atoms.

H107
TRIGGER MECHANISM

Kevin T. Bauer, Warwick, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 19, 1985, Ser. No. 777,793
Int. Cl.[4] F41D *11/02*
U.S. Cl. 89—149 **10 Claims**



1. A trigger mechanism for an automatic weapon comprising:

a receiver;

a bolt mechanism reciprocatably mounted in said receiver and biased to slide from a recoiled position to a firing position;

a hammer positioned alongside said bolt mechanism and pivotally mounted on said receiver for reciprocating between a retracted and a striking position;

bias means attached to said hammer for urging it into a striking position;

a trigger rotatably mounted on said receiver; and

catch means connected between said trigger and said hammer for releasably holding said hammer, said catch means being operable to retract said hammer in response to rotation of said trigger, said bolt mechanism including:

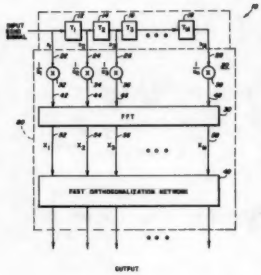
stop means for engaging said hammer and holding said bolt mechanism at said recoiled position, said catch means being operable to release said bolt mechanism from said stop means by retracting said hammer; and

toggle means positioned for engaging said catch means and causing it to release said hammer as said bolt mechanism arrives at said firing position.

H108
RADAR DOPPLER PROCESSOR USING A FAST ORTHOGONALIZATION NETWORK

Karl Gerlach, Dunkirk, Md., assignor to The Government of the United States, Washington, D.C.

Filed Oct. 15, 1985, Ser. No. 786,982
Int. Cl.[4] G01S *13/28*
U.S. Cl. 343—5 FT **2 Claims**



1. A radar doppler processor using a fast orthogonalization network, comprising:

a radar echo signal input;

M, M=N−1, Tap delay lines, for obtaining a set of N consecutive samples of said radar echo signal input, sampled at a rate of the radar system's pulse repetition rate;

N digital multipliers to apply a weighting function, $1/a_n$, to each of said N consecutive samples, wherein

$$a_n = \frac{\sin\left[\frac{\pi}{N}\left(n - \frac{N+1}{2}\right)\right]}{\frac{\pi}{N}\left(n - \frac{N+1}{2}\right)}, \quad n = 1, 2, \ldots, N;$$

a N-point Fast Fourier Transform network for dividing the weighted samples into a set of doppler frequency subband signals and generating a separate subband output signal for each of the subbands; and

a fast orthogonalizing network to orthogonalize each of said subband output signals to eliminate cross-correlations between all output signals.

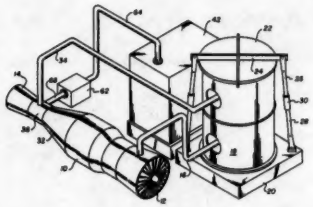
H109
SMOKE GENERATOR

Christian S. Gardner, Edgewood, and Eric J. Boschert, Riverdale, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 577,462, Feb. 6, 1984, abandoned. This application Nov. 14, 1985, Ser. No. 798,077
Int. Cl.[4] B05B *1/24*
U.S. Cl. 239—129 **5 Claims**

1. A smoke, obscurant generation system, having a turbine jet engine, comprising (i) a fog source of oil comprising a means for pumping oil having a pipe output means connected to the exhaust port of said jet engine; and (ii) a power, smoke generator comprising a container having powder therein, including an input line connected to an air pressure source, an outlet line connected to the exhaust port of said jet engine, and means for discharging to atmosphere powder exiting said container through said outlet line, said container having a bottom and inclined walls to reduce the size of said bottom,

said input and said outlet lines terminating in said container near said bottom, said input line end taking the form of a ring



around the container funnel bottom to create a localized fluidized bed.

H110
TRACKING OF AIR MASS MOVEMENT

Irving F. Barditch, Baltimore, and Orville C. Bowersox, Frederick, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

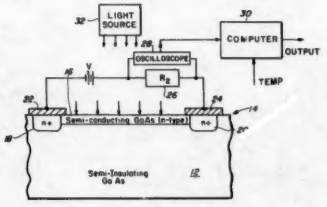
Filed Nov. 14, 1985, Ser. No. 799,531
Int. Cl.[4] C12Q *1/02, 1/24, 1/04, 1/085*
U.S. Cl. 435—29 **5 Claims**

1. In a method of monitoring the movement of an air mass comprising releasing a tracer entity into the atmosphere at a given location, collecting a sample of the ambient air at a different location and analyzing the sample of the collected air for the presence of the tracer entity, the improvement which comprises employing *Bacillus thurengiensis* as the tracer entity and conducting the analysis by performing a culture on the collected sample in a medium capable of supporting *Bacillus thurengiensis* growth.

H111
GALLIUM ARSENIDE MATERIAL AND PROCESS EVALUATION BY MEANS OF PULSED PHOTOCONDUCTANCE IN TEST DEVICES

Larry D. Flesner, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1985, Ser. No. 806,573
Int. Cl.[4] G05B *23/00*
U.S. Cl. 324—158 D **4 Claims**

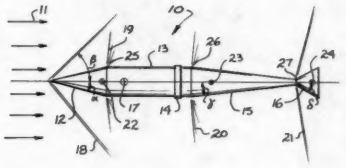


1. A method for determining characteristics of a substrate of semi-insulating gallium arsenide comprising the steps of:
forming an n-channel on said surface of said gallium arsenide substrate;
forming first and second contacts to said n-channel on said gallium arsenide substrate;
applying a voltage to said first and second contacts;
illuminating said n-channel with a set of light pulses from a light source;
measuring the time dependent conductance of said n-channel.

H112
PROJECTILE STABILIZER

William F. Donovan, Aberdeen, and Michael Nusca, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 595,099, Mar. 30, 1984. This application Jan. 3, 1986, Ser. No. 820,482
Int. Cl.[4] F42B *13/00, 13/24, 15/00*
U.S. Cl. 102—501 **16 Claims**

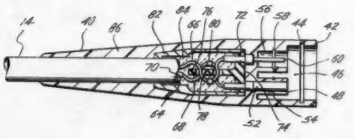


1. A projectile comprising:
a forward nose section;
a main body connected to said nose section at one end of said main body, said main body having a maximum diameter; a reversed taper stabilizer section connected to said main body at an opposite end of said main body, having a rearwardly decreasing diameter; and
a tail stabilizer section connected to said reversed taper stabilizer section, having a rearwardly increasing diameter, said tail stabilizer section having a maximum diameter at most equal to said maximum diameter of said main body.

H113
WATERBLOCK AND STRAIN RELIEF FOR ELECTRICAL CONNECTORS

William McNeel, 9411 Neff, Houston, Tex. 77036

Filed Jan. 27, 1986, Ser. No. 822,373
Int. Cl.[4] H01R *13/58*
U.S. Cl. 339—105 **5 Claims**



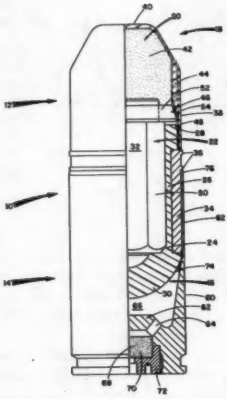
1. A watertight connector assembly, including a first and a second connector, each having at least one end receiving a cable having at least two stranded conductors therein, and another end for engaging said other connector in a watertight arrangement, comprising:
(a) strain relief means disposed within each of said connectors and having said stranded conductors laced therethrough.
(b) at least two contacts disposed within said strain-relief means, each connected to one of said conductors, said contacts and strain-relief means arranged within said connector so that said contacts are disposed in said end of said connector for engaging said other connector; and
(c) water block means within said connector for preventing moisture from entering therein.

H114

PRACTICE PROJECTILE ASSEMBLY

Richard M. Quintavalle, Freeland, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 29, 1986, Ser. No. 824,327
Int. Cl.[4] F42B *11/16*
U.S. Cl. 102—513 12 Claims



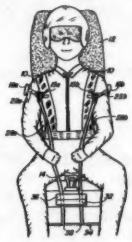
1. A practice projectile assembly, which comprises:
a base member;
a windshield member formed of a frangible material and defining a cavity;
a signal powder disposed in said cavity of said windshield member; and
a piston member positioned within a chamber formed by joining said base member and said windshield member, said signal powder being disposed between said piston member and said windshield member.

H115

ARM RESTRAINT SYSTEM FOR HARNESS MOUNTING

Daniel L. Lorch, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1986, Ser. No. 831,029
Int. Cl.[4] B64D *11/06, 17/30, 25/02*
U.S. Cl. 244—122 A 6 Claims



1. An arm restraint system for an aircraft ejection seat occupant wearing a parachute harness, comprising:
a pair of ribbons attachable at their one ends to the harness at either side between the occupant's waist and shoulders and at their other ends to the back of the harness at either side over the occupant's femur socket joints;
securing means attachable to the harness for slidably routing each of said ribbons behind the occupant's arms and over the pectoral muscles; and
deploying means operatively connected to said ribbons for pulling and keeping said ribbons taut about the occupant's upper arms and forearms during seat ejection, said deploying means automatically disengaging upon separation of the occupant from the seat.

REISSUES

AUGUST 5, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

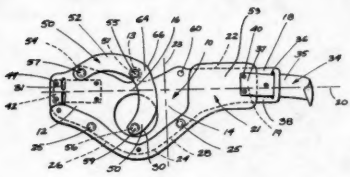
Re. 32,219
PORTABLE CERVICAL COLLAR

Geoffrey C. Garth, 334 Colorado Pl., Long Beach, Calif. 90814

Original No. 4,413,619, dated Nov. 8, 1983, Ser. No. 311,959, Oct. 16, 1981. Application for reissue Feb. 10, 1984, Ser. No. 578,979

Int. Cl.[4] A61F 5/08

U.S. Cl. 128—76 R 10 Claims



1. A cervical collar formed entirely of [a stiff, flexible flat plastic sheet band having an asymmetrical configuration comprising]:

(a) an elongated neck encircling band formed *entirely* of [said] stiff, flexible *plastic* sheet material having front, [and back] side *and opposite side* portions;

(b) a chin support brace, also formed entirely of stiff flexible plastic sheet material having a generally C-shape including fastening means located on each end of said brace;

(c) said chin support brace fastening means being engageable with cooperative attachment means located at least on opposite [sides] *side portions* of said neck encircling band such that when said band is formed into said collar at least one of said fastening means is allowed to align with a respective attachment means thus bowing said brace thereby enabling said brace to obtain an upwardly inclined, conically convex chin rest supported along its' entire length by the upper edge of the front portion of said band and projecting forwardly therefrom;

(d) collar retention means carried at each end of said band and mutually cooperative to retain said band in its collar configuration.

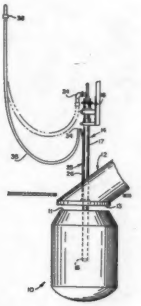
Re. 32,220
LANCE MOUNTED SPRAY APPARATUS

Leo L. Meinert, Baden, and Nicholas M. Rymarchyk, Wexford, both of Pa., assignors to Pullman Berry Co., Harmony, Pa.

Original No. 4,386,763, dated Jun. 7, 1983, Ser. No. 309,646, Oct. 8, 1981. Application for reissue Aug. 6, 1984, Ser. No. 637,888

Int. Cl.[4] C21C 5/32

U.S. Cl. 266—158 15 Claims



1. [For] *In* a steelmaking [operation] *apparatus* including a metal refining vessel having an upper open mouth portion normally positioned upwardly and receiving a vertically moveable gas blowing lance, *and*

means for moving said lance relative to said vessel through said mouth portion, *and*

a hood and duct structure including a hood portion disposed over said mouth portion for gathering fumes emanating from said vessel, *and*

said hood duct having opening means accommodating movement of said lance [the improvement comprising], *and*

a cooling fluid distribution means supportd on said lance for movement therewith and being constructed and arranged to direct cooling fluid into contact with the fumes emanating from said vessel, *and*

said cooling fluid distribution means comprising a spray ring assembly adapted to direct streams of fluid in a generally outward direction, *and*

said spray ring assembly including a plurality of nozzles, *and*

a manifold member supporting said nozzles to direct fluids outwardly from said manifold member for suppressing and cooling of gases emanating from said vessel, *and*

[said plurality of nozzles being interchangeable to achieve a variety of different spray patterns and flow rates,]

[including] *the improvement comprising* means for supporting said [spry] *spray* ring *assembly* on said lance for accommodating lengthwise thermal expansion of said lance relative to said spray ring.

PLANT PATENTS

GRANTED AUGUST 5, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,776

CARNATION PLANT NAMED WINSOME

William E. Duffett, Salinas, and Walter H. Jessel, Jr., Fremont, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 15, 1984, Ser. No. 671,889

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—71 **1 Claim**

1. A new and distinct cultivar of *Dianthus caryophyllus, Linn.*, named Winsome, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of miniature or spray type, commercial double form, 6.0 to 8.0 cm. flower diameter, lavender (red-purple) color, 16 to 18 weeks for response, 10 to 12 flowers and buds per stem, 5 to 8 cm. peduncle length, rigid peduncle strength, 86 to 90 cm. plant height, and strong, spice fragrance.

5,777

CHRYSANTHEMUM PLANT NAMED DEEP LUV

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 28, 1984, Ser. No. 675,648

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Deep Luv, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; red purple ray floret color; diameter across face of capitulum ranging from 9 to 11 cm. at maturity; uniform eight week flowering response; short plant height, and semi-spreading branching pattern.

PATENTS

GRANTED AUG. 5, 1986

ERRATA

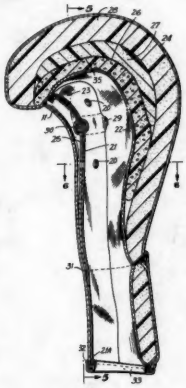
For CLASS	See PATENT NO.
101–415	4,603,641
384–044	4,603,922
384–007	4,603,923
373–060	4,604,135
514–002	4,604,234
530–387	4,604,235
530–307	4,604,236
530–307	4,604,237
530–307	4,604,238
530–317	4,604,239
540–114	4,604,240
540–145	4,604,241
558–260	4,604,242
558–388	4,604,243
558–320	4,604,244
075–247	4,604,259
204–157	4,604,274
281–037	4,604,312

PATENTS

GRANTED AUGUST 5, 1986

GENERAL AND MECHANICAL

4,603,439
BOXING GLOVE
John C. Golomb, Brooklyn, N.Y., assignor to Everlast World's Boxing Headquarters Corp., New York, N.Y.
Continuation of Ser. No. 599,537, Apr. 12, 1984, abandoned, which is a continuation of Ser. No. 543,103, Oct. 18, 1983, abandoned, which is a continuation of Ser. No. 290,822, Aug. 7, 1981, abandoned. This application Dec. 10, 1984, Ser. No. 679,620
Int. Cl.[4] A41D *13/10*
U.S. Cl. 2—18 **12 Claims**



1. In a boxing glove including an inner glove having a principal pocket for receiving the user's hand and fingers and a second pocket for receiving the user's thumb, an outer shell generally encompassing and secured to the inner glove with a space defined between corresponding parts of the inner glove and outer shell, and a quantity padding secured in said space, said outer shell defining a back side and an opposite palm side, the improvement comprising a web of flexible sheet material encompassing said thumb and at least part of said palm side and secured to said boxing glove, and said second pocket being bendable relative to said principal pocket and relative to said web, said principal pocket being bendable about a first axis, said second pocket being bendable about a second axis generally perpendicular to the first axis.

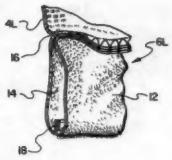
4,603,440
SPORT JERSEY
James M. Hale, 21100 Lemarsh, Chatsworth, Calif. 91311
Filed Sep. 19, 1984, Ser. No. 652,748
Int. Cl.[4] A41B *1/00*
U.S. Cl. 2—115 **3 Claims**

1. A jersey, comprising:

a jersey formed from an open weave material and having a pair of sleeves extending to the vicinity of the wearer's wrists, and

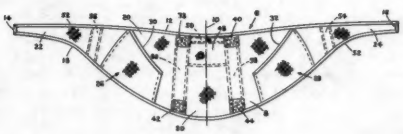
a pair of cuffs attached to the ends of the respective sleeves and adapted to extend over the wearer's wrists,

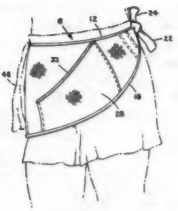
each cuff comprising an inner resilient layer dimensioned to resiliently bear against the wearer's wrist, the inner layer comprising a terry cloth having a weight in the approximate range of 10 to 10.5 ounces per yard, the terry cloth having an absorbent, uncut pile adapted to absorb perspiration running down the wearer's arm, and an outer resilient layer of a ribbed material, the ribbed material having a weight in the approximate range of 8–8.5 ounces per yard and being characterized by an air porous weave that enables a flow of air to the inner terry cloth layer to dry and cool the terry cloth layer,



the inner and outer layers of each cuff being formed from separate pieces of material which are seamed together along opposite edges of the cuff and mutually unattached between the seams, each cuff being joined to the end of a respective sleeve by a seam which is common to one of the seams joining the inner and outer layers.

4,603,441
SPORT GARMENT FOR WOMEN
Lois M. Richter, 69 W. Brother Dr., Greenwich, Conn. 06830
Filed Aug. 2, 1985, Ser. No. 761,862
Int. Cl.[4] A41D *1/14*
U.S. Cl. 2—211 **11 Claims**





1. A sport garment for women, said garment having an outer side and an inner side and comprising a fabric piece having a maximum dimension perpendicular to a centerline, an upper edge extending both ways from said center line from a first end of said garment to a second end of said garment, a lower edge including a curved central portion defining a central garment portion symmetrical with respect to said centerline and having a center of curvature above said lower edge, and first and second end portions extending from said central portion to said first and second garment ends and defining first and second garment end portions, respectively, first and second pockets on said central garment portion on the outer side of said garment and symmetrical with respect to said centerline and spaced therefrom, each said pocket having an opening generally facing said upper edge, said garment being wearable with said end

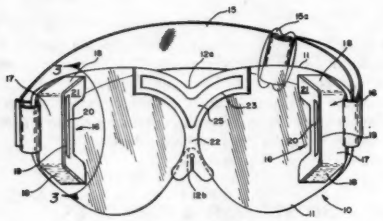
portions releasably joined to each other about a wearer's waist with said inner side confronting the wearer's body with said central portion on that hip of the wearer selected by the wearer and with one of said pockets on the front of the wearer's body and accessible to that hand of the wearer selected by the wearer, said opening of each said pocket being oriented diagonally upward from the end thereof adjacent said centerline to the end thereof remote from said centerline.

4,603,442

SINGLE LENS GOGGLE

Kenneth E. Barfield, 1283 E. South Temple, Salt Lake City, Utah 84102

Filed Dec. 28, 1984, Ser. No. 687,572
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—447 **14 Claims**



1. A single lens goggle comprising, a single lens formed from a clear shatter resistant plastic material adapted to cover a wearer's eye socket areas extending to and over the wearer's temple areas, said lens being shaped to encourage bending across a vertical center thereof; means for securing a strap means to said lens ends to maintain the goggle across the wearer's face; a nose bridge mount means formed from a soft flexible material secured to said lens across the vertical center thereof and formed to provide a nose bridge engaging rest on one end thereof with a nose bridge pad receiving channel formed in the other; a nose bridge pad formed from a soft flexible material to have a shape that conforms to said nose bridge mount channel internal dimensions to form an interference fit of said pad within said channel so as to be removably mounted in said channel; temple pad mount means formed from a soft flexible material that are secured to said lens, one mount to each lens end area; and temple pads, each formed from a soft flexible material that are each shaped to cover a goggle wearer's temple area providing a lens support point at each temple area, each pad including a hole formed therethrough to receive one of said temple pad mounts fitted therein forming a interference fit so as to be removably mounted on said temple pad mounts.

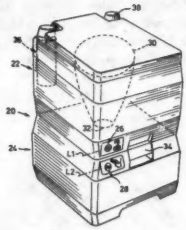
4,603,443

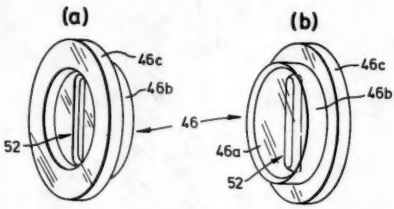
TOILET WITH SIGHT GAUGE

John M. Stewart, Ontario, Canada, assignor to Sanitation Equipment Limited, Concord, Canada

Filed Oct. 9, 1984, Ser. No. 658,939
Int. Cl.[4] E03D *1/00, 3/00, 5/00*
U.S. Cl. 4—314 **5 Claims**

1. A toilet which includes a bowl for receiving waste and at least one tank forming either a holding tank for receiving waste from the bowl, or a reservoir for containing flushing liquid to be delivered to the bowl, wherein the tank has an external wall which is provided with a liquid level indicator visible at the exterior of the toilet and comprising a sight gauge in the form of an at least partially transparent disc-shaped insert having a centre portion of circular shape received in a complementary opening in a wall of the tank, and a surrounding flange sealed to said wall, said insert being positioned in said wall with its centre at a height selected to substantially coincide with a critical liquid level in the tank at which the tank should be refilled where the tank is a reservoir or at which the tank should be emptied where the tank is a waste holding tank, said insert being adapted to permit the level of liquid in the tank to be observed from externally of the toilet at said critical level and sufficiently in advance of said level to provide a user with a warning that the critical level is being approached, said insert





being made of a translucent material preventing clear viewing of the interior of the tank, and being provided with a highlight formed by an elongate strip of reduced thickness compared with the remainder of the insert, said strip being oriented so that the surface of liquid in a tank extends transversely of the strip, and being dimensioned to permit the liquid level in the tank to be clearly viewed through the highlight.

4,603,444

CONVERTIBLE FURNITURE APPARATUS

Bevan D. Suits, 2200 S. Aldrich, Minneapolis, Minn. 55405

Filed Oct. 15, 1984, Ser. No. 660,731
Int. Cl.[4] A47C *20/00*
U.S. Cl. 5—431 **6 Claims**

1. An article of manufacture convertible into a number of reclining and sitting positions, comprising:

a plurality of parallel resilient cushioning bolster elements defining an occupant supporting area;

a corresponding plurality of spindles, each of which extends longitudinally through a respective bolster element and wherein the end of each spindle defines a pair of adjacent

annular grooves for respectively receiving adjacent links, and

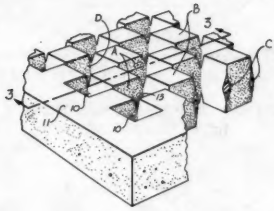
a plurality of links apertured to fit over the spindle ends with overlapping ends extending between the ends of adjacent spindles and rotatably joining the spindles and bolster elements to each other in any one of a number of selectable relative positions for reclining and sitting, the links being constructed and arranged to interconnect the ends of the spindles such that the resilient bolsters are compressed against each other whereby they exert force tending to maintain the elements in assembly.

4,603,445

SUPPORT PAD AND METHOD OF MANUFACTURE

Donald C. Spann, Greenville, S.C., assignor to Span-America Medical Systems, Inc., Greenville, S.C.

Filed Sep. 9, 1983, Ser. No. 530,519
Int. Cl.[4] A47C *27/14*
U.S. Cl. 5—481 **2 Claims**



1. A foam pad, comprising:

a foam block having upper and lower surfaces;

a plurality of upstanding four-sided projections integrally associated in checkerboard patterns on both of said surfaces of said block, and having planar apex surfaces;

a generally flat surface on at least one surface of said block, said flat surface being defined by said planar apex surfaces;

a plurality of generally four-sided voids, defined by said block, on each side of a plurality of said projections and extending completely through said block;

connecting foam portions integrally joining corners of said projections, at points thereof beneath said flat surface, to corners of adjacent projections; and

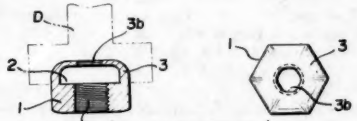
said projections having planar sidewalls slightly slanted from being perpendicular to said flat surface, and said connecting foam portions having quadralateral cross-sections in a plane perpendicular to said flat surface.

4,603,446

METHOD OF MAKING LOCK NUTS

Kunihiko Ozawa, 39-6, Tsurukawa 4, Machida, Tokyo, Japan

Filed Jun. 4, 1985, Ser. No. 741,270
Int. Cl.[4] B21D *53/24*
U.S. Cl. 10—86 A **2 Claims**



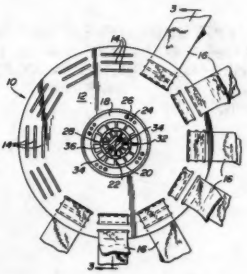
1. A method of making a lock nut comprising the steps of providing a polygonally-shaped blank with a plurality of flat side surfaces and an axial threaded through bore, forming a cylindrical recess of larger diameter than the through bore in one end portion of the blank, removing material from the exterior of said one end portion to provide said one end portion with a continuous annular rim of substantially uniform thickness and an outer surface with a plurality of sloping surfaces tapering outwardly from said annular rim to define a crown portion on said nut having thicker portions at apices of said flat sides and thinner portions along said flat sides between said apices in said crown portion, compressing the crown portion inwardly with differential deformation of the thinner and thicker portions to provide a central opening in the crown portion substantially aligned with the through bore, threading the opening in conformity with the through bore, and further compressing the crown portion with differential deformation of the thinner and thicker portions to reduce the diameter of the opening and provide same with a profile which is distorted from a circle toward a polygon conforming substantially to the polygonal shape of the nut.

4,603,447

DISK TYPE BRUSH

Carl C. Beer, Philadelphia, Pa., assignor to Sherman Industries, Inc., Palmyra, N.Y.

Filed Feb. 19, 1985, Ser. No. 703,170
Int. Cl.[4] B24D *13/06, 13/10*; B60S *13/06*
U.S. Cl. 15—97 B **11 Claims**



1. A brush comprising generally elongated non-rigid brush elements arranged around the circumference of a circular disk, means integral with the disk for frictionally securing the brush elements to the disk consisting of a plurality of openings through the disk adjacent the outer rim of the disk and arranged in groups of at least two radially-spaced openings, the groups being at spaced intervals around the circumference of the disk, and coupling means adjacent the center of the disk for coupling the disk to a drive means for rotating the disk.

4,603,448

ROTARY ELECTRIC TOOTHBRUSH

Frederic H. Middleton; David V. Mollenhoff, both of Madison; Theodore L. Taylor, Manitowoc, and Thomas N. Vaughn, Columbus, all of Wis., assignors to MTV Associates, Madison, Wis.

Filed Jun. 7, 1985, Ser. No. 742,198
Int. Cl.[4] A46B *13/02*
U.S. Cl. 15—22 R **17 Claims**

1. A rotary electric toothbrush comprising:

a. a power handle having a foot and a motor, the motor having a rotatable power shaft;

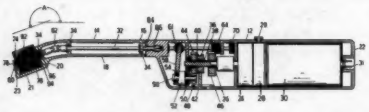
b. means for supplying electrical power to the motor;

c. a longitudinally extended brush stem attached to the power handle at a point remote from the foot and extending therefrom to terminate at a stem head;

d. a brush cartridge attached to the stem head and extending therefrom to terminate at a toothbrush head, so that "headward" indicates a direction toward the toothbrush

head and "footward" indicates a direction toward the foot, the brush cartridge including at least one generally cylindrical brush the longitudinal axis of which is oriented approximately headward-to-footward;

e. a drive shaft extending from the power handle to the brush, the headward end of the drive shaft including means for engaging the brush and transmitting to it the motion of the drive shaft; and



f. transmission means for transmitting the motion of the power shaft to selectively cause the drive shaft alternatively to rotate about its longitudinal axis or to move parallel thereto in a reciprocating manner, whereby a user of the electric toothbrush may direct power from a single motor selectively to cause the brush to rotate about its longitudinal axis and, alternatively, to move in a reciprocating manner parallel thereto.

4,603,449

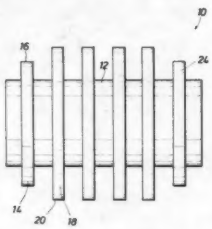
UNITIZED PIG BODY FOR PARAFIN REMOVAL

Kenneth M. Knapp, 1209 Hardy St., Houston, Tex. 77020

Filed May 3, 1985, Ser. No. 730,271

Int. Cl.[4] B08B *9/04*

U.S. Cl. 15—104.06 R **11 Claims**



1. A unitized paraffin scrapping pig comprising an elongate body having a leading end disc which is undergaged, at least two intermediate discs on said body which are overgaged, and wherein said leading disc is at least about 90 durometer and said leading disc is at least about 20 durometer harder then said intermediate discs.

4,603,450

FRAME FOR A FLOOR WIPER

Rainer Osberghaüs, Duesseldorf; Bernfrid Scheller, Pulheim; Roland Schunter, Lorch-Waldhausen; Franz Kresse, Hilden, and Helmut Schell, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

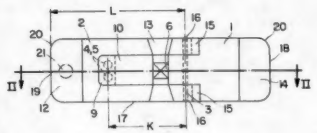
Filed Jan. 11, 1985, Ser. No. 690,787

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400871; Mar. 30, 1984, 3411858

Int. Cl.[4] A47L *13/258*

U.S. Cl. 15—147 A **13 Claims**

1. In a frame for a floor wiper comprising a flat frame shape equipped with a handle socket, which frame is designed to be introduced at its longitudinal ends into the end pockets of a replaceable mop, consisting of two frame members foldable towards one another about a pivot pin extending substantially parallel to the bottom surface of said flat frame shape and lockable in the fully extended or open position by a lock means, the improvement consisting essentially in that one of the two frame members has a T-shape and the other frame member has a U-shape, said T-shape and said U-shape adapted to form a substantially rectangular plate flat frame shape, said pivot pin



extending substantialy perpendicularly to the longitudinal direction of the arms of the T-shape and the U-shape of said two frame members, and said lock means comprises a permanent magnet and counter-plate forming a permanent magnet clamp.

4,603,451

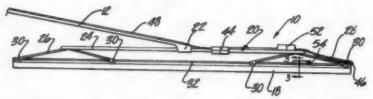
HEATED WINDSHIELD WIPER ASSEMBLY

Robert O. VanSickle, 25538 New York St., Dearborn Heights, Mich. 48125

Filed Apr. 29, 1985, Ser. No. 728,195

Int. Cl.[4] A46B *9/04*

U.S. Cl. 15—250.07 **12 Claims**



1. A heated windshield wiper assembly adapted to be mounted on the wiper arm of a motor vehicle, said wiper assembly comprising:

a flexible wiper blade;

a wiper blade supporting assembly wherein said supporting assembly demountably supports said wiper blade;

a heating element secured to said supporting assembly, said heating element extending substantially the length of said supporting assembly;

means for pivotally securing said supporting assembly to said motor vehicle wiper arm;

means for conducting electrical power from the power source of said motor vehicle to said heating element;

first temperature responsive means for detecting the ambient air temperature, said first temperature responsive means secured to said blade supporting assembly; and

second temperature responsive means for detecting the temperature of said heating element.

4,603,452

DETACHABLE HINGE WITH CONVENIENTLY RELEASABLE HINGE FLAPS

Peter M. Paciorek, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Jan. 22, 1985, Ser. No. 693,063

Int. Cl.[4] E05D *5/12, 7/12*

U.S. Cl. 16—262 **18 Claims**

1. An easily separable hinge device of conventional appearance, in which the hinge flaps may be hingedly connected together, or disconnected within limited working space by only short axial movement of the hinge pin, comprising:

first and second hinge flaps for attachment to structures to be hinged together;

each flap having tube-like knuckle means with longitudinally adjacent gap means in castellated formation with said knuckle means;

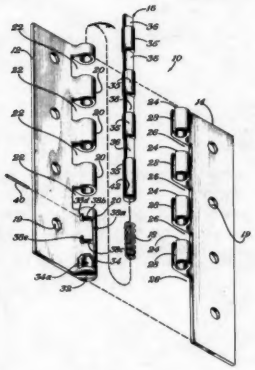
the knuckle means of one of the flaps adapted to be interdigitated and axially aligned with knuckle means of the other flap;

the knuckle means of one of the flaps provided with longitudinal slot means opening through one side thereof;

hinge pin means positionable in and pivotable in knuckle means of both of said flaps for hingedly holding one flap to the other;

said hinge pin being formed along its length with flat and cylindrical portions slidable in said knuckle means;

said slot means adapted to slide transversely of said pin over said flat portions thereof positioned in gap means of said



first hinge flap to position said slotted knuckle means around the hinge pin and axially align the knuckle means of both flaps or to separate said slotted knuckle means from said pin and said first flap;

said hinge pin being axially slidable in said knuckle means between a first or unlocked position in which said flat portions are positioned in the gap means of one of the flaps whereby the knuckle means of the flaps may be brought into alignment, and a second or locked position in which said cylindrical portions are within said slotted knuckle means whereby said flaps are prevented from being separated at all pivotal positions of the flaps.

4,603,453

DEVICE FOR ATTACHING A DETECTABLE SHOPLIFTING PREVENTION BODY

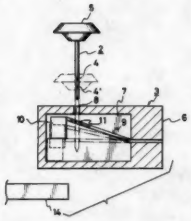
Ryuzo Yokoyama, Hiroshima, Japan, assignor to Kabushiki Kaisha Yokoyama Seimitsu Kousakusho, Hiroshima, Japan

Filed Mar. 4, 1985, Ser. No. 707,805

Claims priority, application Japan, Mar. 3, 1984, 59-30113[U]

Int. Cl.[4] A44B *9/00;* **G08B** *21/00*

U.S. Cl. 24—155 R **5 Claims**



1. A device for attaching a detectable shoplifting prevention body to a commodity, comprising:

a non-magnetically attractive hollow body;

a first hole in a wall of said hollow body, said first hole having a center line;

a resilient plate positioned in the hollow of said body and having a first end fixed to said body, said plate being normally resiliently positioned such that said plate entends from said first end towards said wall at an oblique angle to said wall;

a magnetically attractive core in said hollow body and fixed to a second end of said plate;

a pin having a grip member and being sized to fit through said first hole, said pin having at least one small diameter portion near an end thereof and groove means along the length thereof;

a second hole in said plate, said second hole being sized to permit passage of said pin when the length of said plate entends substantially perpendicular to an axis of said pin, wherein said resilient plate will flex toward said groove means for locking said pin to said housing, said second hole being positioned such that when said plate is in said normal position, an edge of said pin closest to said core is positioned between said center line of said first hole and said core and sufficiently close to said center line of said first hole that said pin cannot fit into said second hole; and

a detectable body having a third hole sized to permit passage of said pin.

4,603,454

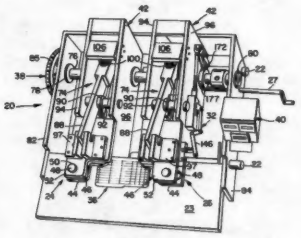
HINGE FORMING AND ATTACHING APPARATUS

Alex P. Janssen, Jr., P. O. Box 43, Earlysville, Va. 22936, and Alexander P. Janssen, 28 Old Farm Rd. Belair, Charlottesville, Va. 22901

Continuation of Ser. No. 430,246, Sep. 30, 1982, abandoned. This application May 7, 1984, Ser. No. 607,597

Int. Cl.[4] B21D *53/40;* **B21K** *13/02;* **B23P** *19/00*

U.S. Cl. 29—11 **12 Claims**



1. Apparatus for forming a hinge and for affixing it to an article, said apparatus comprising: means for feeding a strip of metallic material in a first rectilinear path to a first station; means at said first station for forming a hinge blank having a pair of spaced apart legs from said strip and for partially forming a hinge barrel at the opposite end of said blank from said legs; means for transfering said blank from said first station in a second rectilinear path oriented at right angles to said first path to a second station and then to a third station; means at said second station for bending said hinge legs generally normal to the hinge body and for effecting a further partial formation of the hinge barrel; and means at said third station for completing the formation of the hinge barrel, driving the hinge legs through an article as aforesaid theretofore located at said third station, and bending said hinge legs toward said article to clinch said hinge thereto.

4,603,455

METHOD FOR MAKING A THIN-FILM HUMIDITY SENSOR FOR MEASURING ABSOLUTE HUMIDITY

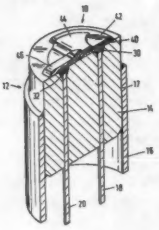
Wolfgang Woest, Rheinfelden; Rainer Silbermann, and Frank Hegner, both of Schopfheim, all of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Division of Ser. No. 564,212, Dec. 22, 1983, Pat. No. 4,530,030. This application Apr. 19, 1985, Ser. No. 724,913

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313150

Int. Cl.[4] H01G *4/06*

U.S. Cl. 29—25.42 8 Claims



1. Method of making a thin-film humidity sensor for measuring absolute humidity, characterized in that in a bushing body (14) of electrically insulating material at least two axial bores (22, 24) are formed spaced apart from each other which widen towards the end face of the bushing body (14), that in each bore a lead-through conductor (18) is disposed so that it projects into the widening (26, 28), that each lead-through conductor (18, 20) is connected to the bushing body (14) by means of brazing solder (30, 32) which fills the widening (26, 28), that the end face (34) of the bushing body (14) together with the brazing solder (30, 32) disposed in each widening (26, 28) is ground plane and polished, that to a portion of the end face (34) a metal layer forming the base electrode (40) is applied so that said layer is electrically connected to the brazing solder (30) disposed in a widening (26) and does not cover the brazing solder (32) disposed in another widening (28), that on the metal layer (40) a moisture-sensitive dielectric layer (42) is formed, and that a further metal layer forming the top electrode (44) is applied to the portion of the end face (34) not covered by the base electrode (40) and to at least a portion of the moisture-sensitive layer (42) in such a manner that said further layer is electrically connected to the brazing solder (32) disposed in the other widening (28).

4,603,456

MACHINING EQUIPMENT FOR PRODUCTION LINES

Minoru Hiroyasu; Hitoshi Hashimoto; Susumu Yamada; Masaki Miyanaka, and Hideharu Koizumi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00230, § 371 Date Feb. 3, 1983, § 102(e) Date Feb. 3, 1983, PCT Pub. No. WO82/04414, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 16, 1982, Ser. No. 466,357

Claims priority, application Japan, Jun. 16, 1981, 56-93359

Int. Cl.[4] B23Q *39/04*

U.S. Cl. 29—33 P 11 Claims

1. Machining equipment for a production line, comprising:

a base;

a frame mounted on said base;

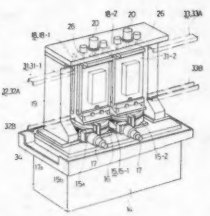
at least one horizontal rotary table mounted on said base;

means for indexing said horizontal rotary table;

a support member fixed at a lower portion thereof to said horizontal rotary table and rotatably supported at an upper portion thereof to said frame concentrically with the center of rotation of said horizontal rotary table;

a pair of holding rail members mounted on said support member;

said holding rail members being adapted to hold a pallet type jig, being vertically spaced from each other, and extending in a horizontal direction;



a spindle head for machining a workpiece on said jig;

means for controlling said spindle head;

a conveyance line adapted to convey said jig; and

means for transferring said jig between said conveyance line and said holding rail members.

4,603,457

METHOD AND DEVICE FOR MAKING A WRAPPED JOINT

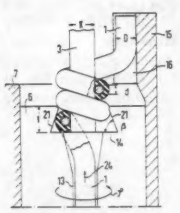
Ernst F. Lechner, Erlangen, and Peter Vache, Herzogenbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 12, 1982, Ser. No. 407,595

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 31319549

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—33 F 11 Claims



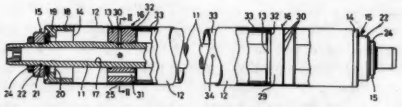
1. Device for performing a method of forming an electrically conductive wire-wrap connection between a wire and a metallic pin, having a stationary guide sleeve with a rotating wrapping insert received therein for guiding a wire to be wrapped in a continuous elongated channel, and formed with a central bore-hole wherein a pin is received, comprising an end face formed on the wrapping insert and facing the pin, said end face being formed with a transverse slot wherein the elongated channel terminates, and which widens at least section wise towards the bottom of said transverse slot, said transverse slot having a depth greater than the diameter of the wire.

4,603,458

ROLLER SUPPORTED BY A PNEUMATIC BEARING

Nobuyuki Hirohata, Yakayama, Japan, assignor to Sanko Kikai Co., Ltd., Wakayama, Japan

Filed Mar. 13, 1985, Ser. No. 711,208
Claims priority, application Japan, Sep. 14, 1984, 59-193660
Int. Cl.[4] B21B *31/08, 27/00;* B60B *7/04*
U.S. Cl. 29—130 9 Claims



1. A roller comprising:

a fixed shaft having a longitudinally extending central axis and a longitudinally extending central passage for directing air longitudinally therethrough;

an outer cylinder having a thin wall having a cylindrical inner surface, covering said fixed shaft in radially spaced relation thereto, to prevent distortion of said outer cylinder;

annular members fastened to said fixed shaft, having peripheral surfaces spaced from the inner surface of said outer cylinder so as to define very narrow gaps therebetween in fluid communication inside said outer cylinder with both of said opposite ends of said outer cylinder, said annular members having annular grooves on said peripheral surfaces, said shaft and said annular members having holes therein providing fluid communication between said annular groves and said central passage;

a flow regulator means for adjusting an amount of air flowing out of both of said opposite ends of said outer cylinder; and

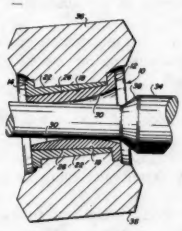
means, including porous sheet material in said gap surrounding said peripheral surfaces of said annular members, for distributing air jetting from said annular groove into said gaps with even pressure distribution in said gaps, whereby the air in said gaps defines air bearings rotatively supporting said outer cylinder.

4,603,459

ROCKER BUSHINGS FOR PIVOTAL MOVEMENT

James C. Buchanan, 2500 21st St. #42, Winter Haven, Fla. 33881

Filed Nov. 12, 1985, Ser. No. 797,260
Int. Cl.[4] B21B *31/08;* F16C *25/00*
U.S. Cl. 29—130 18 Claims



1. A bushing for a shaft mounted roller structure adapted to bear the weight of a boat or the like, said bushing comprising:

(a) a first and second member being of annular cross-section, surrounding the shaft and supporting the roller;

(b) each annular member having a longitudinal portion of annular cross-section throughout the length thereof, and terminating at a radially outwardly extending stop flange of increased radial thickness with respect to the radial thickness of the longitudinal portion.

(c) said first member having an inner bearing surface between said first member and the shaft;

(d) said second annular member having a radial thickness for contacting and receiving the longitudinal portion of the first annular member to provide an adequate support thereof, between said first and second annular members; and

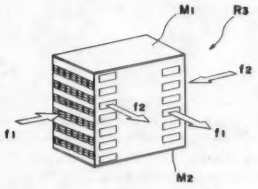
(e) said second member having an outer forming support surface between said second member and the roller.

4,603,460

METHOD FOR MANUFACTURING A HEAT EXCHANGER

Nobuyuki Yano, Hirakata; Takashi Inami, Suita; Mitsuru Ieki, Tsuzuki, and Masao Wakai, Kasugai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Matsushita Seiko Co., Ltd., both of Osaka, Japan

Filed Sep. 26, 1984, Ser. No. 654,673
Claims priority, application Japan, Sep. 30, 1983, 58-183383
Int. Cl.[4] B21D *53/02;* B23P *15/26;* B31D *3/02;* B32B *7/14*
U.S. Cl. 29—157.3 V 11 Claims



1. A method of manufacturing a heat exchanger, comprising the steps of:

forming patterns of a bonding material on sheets;

after said step of forming patterns, laminating the sheets so that the bonding material on the sheets bonds the faces of successive sheets together to form a laminate;

expanding the laminate in a circular direction generally perpendicular to the faces of the sheets into an expanded state in a cylindrical configuration, so as to form flow passages between bonded portions in non-bonded portions of successive sheets; and

after said step of expanding the laminate, fixing the laminate in the expanded state;

said step of forming patterns including the step of forming patterns of the bonding material such that flow passages on opposite sides of each sheet after said step of expanding the laminate are in heat exchanging relationship with each other, and each of the flow passages formed in said step of expanding communicate with the exterior of the laminate at opposite ends thereof.

4,603,461

GARAGE DOOR SPRING STRETCHER

Jerald R. Whippie, 1113 W. Workman Ave., West Covina, Calif. 91790, and John F. Hartman, 1380 Calle Galante, San Dimas, Calif. 91773

Filed Dec. 18, 1984, Ser. No. 682,982
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—227 10 Claims

1. A spring extending device comprising an elongate frame with upper and lower ends, inner and outer sides and oppositely disposed lateral sides, a spring engaging saddle at the inner side of the frame engageable with an exterior side of an elongate helical tension spring on an axis parallel with and spaced inward of the frame, an elongate flexible spring-engaging girdle with one end anchored at one side of the frame and extending inwardly laterally and outwardly about a spring

adjacent said inner side of the frame and releasable connecting means at the other side of the frame releasably connecting the other end portion of the girdle to the frame, a windlass carried by the frame and including an elongate laterally extending drum with opposite ends rotatably supported at opposite sides of the frame, a ratchet wheel at one end of the drum, an elongate pawl with one end pivotally connected to a side of the frame and having a dog at its other end releasably engaging the

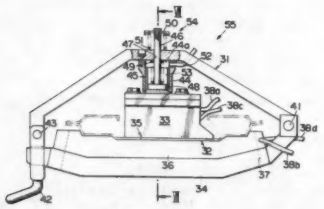
ratchet wheel, a drive head at one end of the drum accessible at the exterior of the frame, an elongate flexible tow line with one end portion connected with and wound about the drum and having a free end portion extending longitudinally from the frame and a tow line connector on the free end of the tow line to connect with a reactive structure spaced from that end of the frame disposed in the direction a related spring is to be extended.

4,603,462

JOINING JIG FOR VEHICLE BODY PANELS

Takumi Kondo, Fukuoka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Feb. 8, 1984, Ser. No. 578,263
Claims priority, application Japan, Feb. 15, 1983, 58-24441
Int. Cl.[4] B25B *5/14*
U.S. Cl. 29—281.1 **9 Claims**



1. A joining jig for use in joining adjoining panels of an automotive vehicle body comprising:

a first contact section having a first contact base member, and a first contact member formed with a first contact surface which is contactable with an inside face of a joint section of the adjoining panels and said first contact member also being operatively connected to said first contact base member;

a second contact section having a second contact base member and a second contact member formed with a second contact surface which is contactable with an outside face of the joint section, said second contact base member being connectable with said first contact base member;

first biasing means including a hydraulic cylinder connected to said first contact base member and a hollow piston movably disposed in said hydraulic cylinder, said hollow piston being connected to said first contact member, said hollow piston defining therein a hydraulic pressure chamber for hydraulic fluid, said first biasing means providing a first biasing force for contacting said first and second contact surfaces with the corresponding faces of the joint section when operated by admitting hydraulic fluid into said hydraulic pressure chamber to act on said piston in a first direction to push said piston out of said cylinder; and

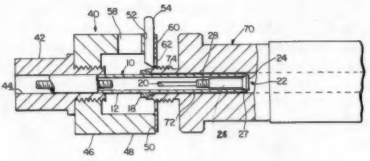
second biasing means including a first spring means disposed within said hydraulic pressure chamber for biasing said piston in said first direction, said second biasing means further including a second spring means disposed outside of said hydraulic pressure chamber for biasing said piston in a second direction opposite said first direction, said second spring means having a lower biasing force than that of said first spring means, said second biasing means biasing said first and second contact surfaces into contact with the corresponding faces of the joint section prior to the operation of said first biasing means.

4,603,463

IN SITU REPAIR OF A FAILED COMPRESSION FITTING

Ronald R. Wolbert, McKees Rocks, and Walter G. Jandrasits, Pittsburgh, both of Pa., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 5, 1985, Ser. No. 762,489
Int. Cl.[4] B23P *6/00, 6/04*
U.S. Cl. 29—402.07 **9 Claims**



1. A method for the in situ repair of a failed compression fitting comprising the steps of:

inserting a portion of a guide tube coaxially in the bore of the fitting;

locking the guide tube coaxially in the bore of the fitting such that a portion of the guide tube extends coaxially from the fitting;

sliding a close fit dethreading device coaxially on the portion of the guide tube against the threads of the fitting;

cutting the threads from the fitting using the dethreading device;

removing the dethreading device and guide tube from the dethreaded fitting;

inserting a new fitting onto the dethreaded fitting with the body of the new fitting overlaying the dethreaded portion; and

welding the main body of the new fitting to the main body of the old fitting whereby the new threaded portion of the new replacement fitting is precisely coaxial with the old threaded portion.

6. An apparatus for the in situ repair of a failed compression fitting comprising:

a guide mandrel which is precisely coaxially aligned with the base of the fitting including

a. a guide tube having a distal end which is inserted in the base of the fitting and a proximal end which extends

from the fitting, said guide tube being sized to closely fit within the bore,

b. a tapered ferrule which is located about said guide tube adjacent said distal end and tapering toward said distal end for engaging the end of the fitting,

c. a plurality of slots in said guide tube extending longitudinally from said ferrule to said distal end, and

d. an expander means for expanding the distal end of said guide tube to lock said distal end in the bore of the fitting; and

a detreading device which is coaxially received on said guide tube, said dethreading device including

a. a guide bushing which is coaxially received on said guide tube in a close sliding fit in order to precisely align said dethreading device coaxial with said guide tube,

b. a cutting tool which extends radially for cutting the threads from the fitting as said dethreading device is rotated, and

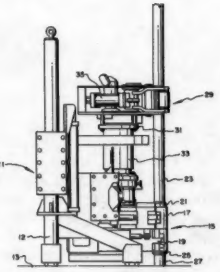
c. an adjusting means for adjusting said cutting tool radially according to the height of the threads on the fitting to be cut.

4,603,464

STAND JUMPING AND STABBING GUIDE DEVICE AND METHOD

Roger Smith, Jr., Georgetown, and Harry D. Hebard, Burnet, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Mar. 11, 1985, Ser. No. 710,730
Int. Cl.[4] B21D *39/03*
U.S. Cl. 29—428 **7 Claims**



1. A well tool, comprising:

a movable carriage;

a torque wrench assembly, mounted on the carriage for movement therewith, and for applying torque to make up and break out connections between two pipe sections;

a spinner, mounted on the carriage for movement therewith, and having clamping cylinders for spinning one pipe section relative to the other;

power means for raising and lowering the spinner relative to the carriage; and

means for automatically opening the clamping cylinders of the spinner whenever the spinner is moved by external forces to a selected position relative to the power means.

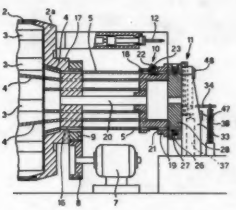
4,603,465

MACHINE FOR MARKING ELECTRIC WIRES

Carlo Bretti; Franco Sermidi, and Medardo Agnelli, all of Milan, Italy, assignors to Eurosab S.R.L., Milan, Italy

Filed Sep. 7, 1984, Ser. No. 648,313
Claims priority, application Italy, Sep. 8, 1983, 22818 A/83
Int. Cl.[4] B23P *23/00*
U.S. Cl. 29—564.6 **13 Claims**

1. A machine for marking electric wires and the like, by means of rings provided with marking symbols, said marking rings being disposed in the form of a marking tube and being joined together by weakened breaking portions, said machine comprising: a frame; a rotary supported magazine for the marking tubes and supported on the frame; means carried by the frame for guiding and feeding, by one ring at a time, any one of the marking tubes towards a ring delivery point; a hollow needle movably carried on the frame; a gripping and tearing device mounted on the frame for breaking off each single ring in said delivery point, said gripping and tearing



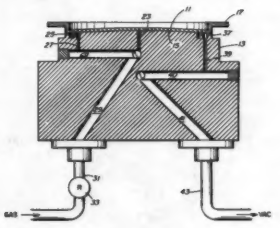
device being movable with respect to the hollow needle, from a ring-gripping position to a second position in which the gripped ring is aligned with the needle; means carried by the frame for moving said gripping and tearing device toward and away from the needle; means carried on the frame for moving the needle along its axis, the needle being movable from a backward position to a forward position with respect to the ring-gripping and tearing device; and means for transferring the marking rings from the needle onto a wire, the end of which wire has been inserted into the hollow needle.

4,603,466

WAFER CHUCK

Morgan J. Morley, Menlo Park, Calif., assignor to GCA Corporation, Andover, Mass.

Filed Feb. 17, 1984, Ser. No. 581,058
Int. Cl.[4] F28F *13/00*
U.S. Cl. 29—569 R **5 Claims**



5. Apparatus for holding a semiconductor wafer during high energy treatment in a vacuum environment, said apparatus comprising:

a circular plate having a domed face;

means for clamping a wafer aligned with said plate to distort the wafer into close proximity with the domed face of said plate whereby an interstitial space is formed between the wafer and said domed face of said plate;

around the periphery of the face of said plate, an annular groove;

in said plate first, port means for connecting said annular groove to vacuum pumping means; and

in said plate, second port means for providing a mobile gas under controlled pressure to said interstitial space between said wafer and the domed face of said plate, said

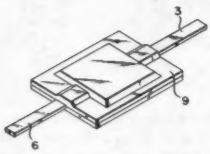
second port means comprising a central opening and a second annular groove which is inboard of the first said annular groove whereby said vacuum pump means connected to said first port means prevents leakage of said mobile gas to the atmosphere.

4,603,467

METHOD OF MANUFACTURING CHIP-TYPE ALUMINUM ELECTROLYTIC CAPACITOR

Shinichi Kaneko, Nagai, Japan, assignor to Marcon Electronics Co., Ltd., Nagai, Japan

Filed May 13, 1985, Ser. No. 733,260
Claims priority, application Japan, May 25, 1984, 59-107045; May 25, 1984, 59-107046
Int. Cl.[4] H01G 9/00
U.S. Cl. 29—570 **12 Claims**



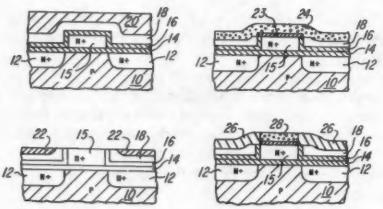
1. A method of manufacturing a chip-type aluminum electrolytic capacitor, comprising the steps of:
- welding a first thin external lead having conductivity to a first flat electrode foil;
- covering the entire surface of the first flat electrode foil with an insulating spacer;
- welding a second thin external lead having conductivity to a second flat electrode foil;
- covering an upper surface of said insulating spacer with the second flat electrode foil, and so covering the first flat electrode foil with said second flat electrode foil, so that said insulating spacer is interposed between said first and second flat electrode foils;
- impregnating said insulating spacer with an electrolytic solution, thereby providing a capacitor element; and
- covering and integrally sealing at least said surfaces of the first and second flat electrode foils with a synthetic resin insulating laminate film.

4,603,468

METHOD FOR SOURCE/DRAIN SELF-ALIGNMENT IN STACKED CMOS

Hon W. Lam, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1984, Ser. No. 656,055
Int. Cl.[4] H01L 21/90, 21/76
U.S. Cl. 29—571 **9 Claims**



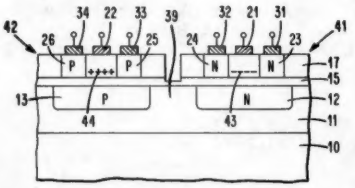
1. A process for fabricating a self-aligned stacked CMOS structure, comprising the steps of:
(a) fabricating source and drain regions having a first conductivity type in a substrate having a second conductivity type;
(b) fabricating a gate region on the surface of the substrate having a sidewall oxide;
(c) forming a first insulating layer containing a dopant of the second conductivity type on the surface of said substrate with an upper surface of the gate region exposed;
(d) forming a second insulating layer over said exposed surface of said gate;
(e) forming a polycrystalline silicon layer over the first and second insulating layers; and
(f) causing dopant from the first insulating layer to diffuse into the polycrystalline layer thereover to form heavily doped upper source and drain regions in the polycrystalline silicon, the portion of the polycrystalline layer therebetween being relatively lightly doped.

4,603,469

FABRICATION OF COMPLEMENTARY MODULATION-DOPED FILED EFFECT TRANSISTORS

Craig A. Armiento, Burlington, and Peter E. Norris, Cambridge, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 25, 1985, Ser. No. 715,698
Int. Cl.[4] H01L 21/20, 21/265
U.S. Cl. 29—571 **6 Claims**



1. The method of fabricating a complementary pair of modulation-doped field effect transistors comprising
- depositing a first layer of undoped semiconductor material on a substrate, said first layer of undoped semiconductor material being of single crystal structure and having a surface,
- introducing N-type conductivity imparting material into a first region of said first layer at said surface, and introducing P-type conductivity imparting material into a second region of said first layer at said surface;
- depositing an epitaxial second layer of undoped semiconductor material on said surface of said first layer to form a spacer layer having an interface with said first layer at said surface thereof and having a surface spaced therefrom;
- depositing an epitaxial third layer of undoped semiconductor material on the surface of said spacer layer to form an undoped third layer of semiconductor material having an interface with said spacer layer of semiconductor material at said surface thereof and having a surface spaced therefrom, the semiconductor material of the third layer having a band gap less than the band gap of the semiconductor material of said first layer;
- placing first and second gate members on said surface of said third layer overlying portions of said first and second regions, respectively, said first and second gate members forming rectifying barriers with the undoped semiconductor material of said third layer;
- introducing N-type conductivity imparting material into spaced apart first and second zones of said third layer extending from the surface of the third layer to said spacer layer and overlying portions of said first region, and introducing P-type conductivity imparting material into spaced apart third and fourth zones of said third layer

extending from the surface of the third layer to said spacer layer and overlying portions of said second region; and applying ohmic contacts to the first and second N-type zones and to the third and fourth P-type zones.

4,603,470

METHOD OF MAKING PLURALITY OF SERIES CONNECTED SOLAR CELLS USING MULTIPLE GROOVE FORMING PROCESSES

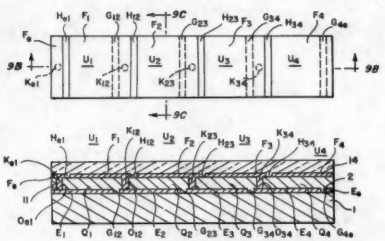
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Lab. Co., Tokyo, Japan

Division of Ser. No. 630,063, Jul. 12, 1984. This application Apr. 5, 1985, Ser. No. 720,291

Claims priority, application Japan, Jul. 13, 1983, 58-128270; Oct. 31, 1983, 58-204441; Mar. 26, 1984, 59-57713

Int. Cl.[4] H01L *21/263, 31/06*

U.S. Cl. 29—572 **12 Claims**



1. A method of manufacturing a photoelectric conversion device which is provided with a plurality of series-connected semiconductor transducers U_1, U_2, . . ., comprising steps of:

(a) forming a first conductive layer on a substrate having a length extending in the direction of said series connected transducers and a width extending in a direction substantially perpendicular to said length, said substrate having an insulating surface;

(b) scribing the first conductive layer by a first laser beam to cut therein a plurality of sequentially arranged first isolation grooves G_{12}, G_{23}, . . ., by which a plurality of sequentially arranged first electrodes E_1, E_2, . . . are formed on the substrate, said first isolation grooves respectively extending in the width direction of the substrate;

(c) forming a non-single-crystal semiconductor laminate member on the substrate to cover the plurality of first electrodes E_1, E_2, . . . and to fill the plurality of first isolation grooves G_{12}, G_{23}, . . .;

(d) digging in the non-single-crystal semiconductor laminate member by a second laser beam, contact grooves O_{12}, O_{23}, . . . to expose therein the first electrodes E_1, E_2, . . . locally to the outside on the side of the first isolation grooves G_{12}, G_{23}, . . ., respectively;

(e) forming on the non-single-crystal semiconductor member second electrodes F_1, F_2, . . . having respective contact portions K_{12}, K_{23}, . . . extending to respectively connect the second electrodes F_1, F_2, . . . to the first electrodes E_2, E_3, . . . through the contact portion K_{12}, K_{23}, . . . where said second electrodes F_1, F_2, . . . are respectively separated by second isolation grooves H_{12}, H_{23}, . . . ;

(f) in the step of scribing the first conductive layer through using the first laser beam, there is cut in the first conductive layer third isolation groove(s) which extend along the direction of arrangement of the semiconductor transducers U_1, U_2, . . . such that the third isolation groove (s) are substantially orthogonal to the first isolation grooves and in which is exposed side(s) of the first electrode E_i (where i=1, 2, . . .) extending along the direction of arrangement of the semiconductor transducers U_1, U_2, ...

4,603,471

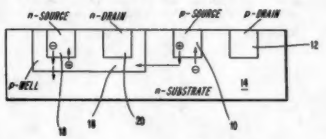
METHOD FOR MAKING A CMOS CIRCUIT HAVING A REDUCED TENDENCY TO LATCH BY CONTROLLING THE BAND-GAP OF SOURCE AND DRAIN REGIONS

Robert J. Strain, San Jose, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Sep. 6, 1984, Ser. No. 647,743

Int. Cl.[4] H01L *21/425, 21/265*

U.S. Cl. 29—576 B **6 Claims**



1. In a CMOS integrated circuit comprising complementary NMOS and PMOS transistors formed on a substrate, a method for reducing the tendency of the circuit to latch comprising the step of implanting ions into the source region of each of the NMOS and PMOS transistors, said ions being of a material having an energy gap which is lower than the energy gap of the material forming the substrate.

4,603,472

METHOD OF MAKING MOS FETS USING SILICATE GLASS LAYER AS GATE EDGE MASKING FOR ION IMPLANTATION

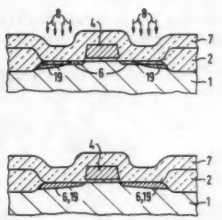
Ulrich Schwabe, Munich; Erwin P. Jacobs, Vaterstetten, and Franz Neppl, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 24, 1985, Ser. No. 694,295

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3415002

Int. Cl.[4] H01L *29/95, 21/283, 21/225*

U.S. Cl. 29—576 B **9 Claims**



1. In a method for the manufacture of a large scale integration (LSI) MOS field effect transistor wherein a gate electrode is generated on a doped silicon substrate, source/drain regions are formed by ion implantation using said gate electrode as an implantation mask and wherein the source/drain regions are shielded by means of an oxide layer extending to the sidewalls of said gate electrode whereby the diffusion of the implanted source/drain regions under the gate electrode area is reduced, the improvement which comprises:

applying a readily flowable boron phosphorus silicate glass layer at a temperature below 900° C. as a gate edge masking for the source/drain ion implantation after formation of said gate electrode, said silicate glass layer being applied by deposition from vapor phase, the thickness of said layer being such that it acts as a mask at the sidewalls of said gate electrode during the subsequent source/drain implantation step to a specific spacing from said gate but thereafter loses its masking effect and is than only sufficiently thick enough in the region remote from the edge of

said gate so that the dopant ions are still implanted into the zone near the surface under said silicate glass layer.

4,603,473

METHOD OF FABRICATING INTEGRATED SEMICONDUCTOR CIRCUIT

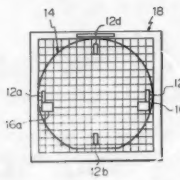
Takashi Suemitsu, and Takashi Niriki, both of Kofu, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,317

Claims priority, application Japan, Oct. 13, 1982, 57-179354

Int. Cl.⁴ H05K *3/06*

U.S. Cl. 29—578 **4 Claims**



1. A method of fabricating an integrated semiconductor circuit device having a plurality of layers of circuit patterns, comprising

forming the circut pattern of at least one of said layers and at least one target mark for a photomask by a direct exposure method using an electron beam, and

forming the circuit pattern of at least one of the remaining layers by a light exposure method using the photomask positioned by means of said target mark.

4,603,474

COLLECTOR FOR AN ELECTRIC MACHINE AND METHOD FOR ITS PRODUCTION

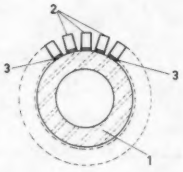
Jens Gobrecht, Gebenstorf, and Claus Schüler, Widen, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed May 17, 1984, Ser. No. 611,514

Claims priority, application Switzerland, Jun. 3, 1983, 3071/83

Int. Cl.⁴ H01R *43/06, 39/04;* **H02K** *1/26*

U.S. Cl. 29—597 **9 Claims**



1. A collector for an electric machine, comprising:

a rotationally symmetrical central sintered ceramic body having a jacket surface; and

radially positioned surface-oxidized metallic segments disposed on said jacket surface, said segments separated from each other by an interspace and bonded to said jacket surface by means of a eutectic intermediate layer.

7. A method for producing a collector for an electric machine, comprising:

initially sintering a rotationally symmetrical ceramic body having a jacket surface;

surface-oxidizing a plurality of metallic segments;

disposing the surface-oxidized segments around the jacket surface of the ceramic body;

exerting a radially acting press-on pressure on the ceramic body and the segments;

heating the ceramic body and the segments with pressure exerted thereon in a furnance to a temperature required for generating a metal/metal-oxide eutectic such that said ceramic body is eutectically bonded to said metal segments; and

cooling down to room temperature the bonded ceramic body and metallic segments.

4,603,475

ELECTRIC PLUG CONNECTOR AND METHOD OF MANUFACTURING

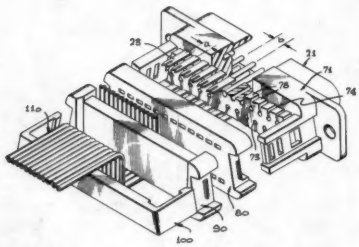
Günter Schütztle, Heilbronn, Fed. Rep. of Germany, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 295,775, Aug. 24, 1981, abandoned. This application Apr. 19, 1985, Ser. No. 724,060

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032585

Int. Cl.⁴ H01R *43/00, 11/20*

U.S. Cl. 29—857 **15 Claims**



1. A method of manufacturing an electrical connector for a flat cable, comprising the steps of: forming an insulating body with contact chambers therein; forming a plurality of contact elements, each contact element having a contact part for contacting with other connectors and extending along a first major axis, a connecting part for coupling to the flat cable and extending along a second major axis which is essentially parallel to said first axis, and a middle part connecting the contact part and the connecting part and extending along a third major axis which is essentially perpendicular to said first axis; inserting said contact elements into said contact chambers; and bending the connecting part of each contact element after insertion of each contact element into said contact chambers about the intersection of said connecting part and said middle part of said contact element.

8. An electrical connector for a flat cable, the connector comprising: a plurality of contact elements and a insulating body having chambers therein for receiving the contact elements, said contact elements being preformed prior to insertion in said chambers, each contact element having a contact part for contacting other connectors, a connecting part for coupling to the flat cable and a middle part connecting the contact part and the connecting part, said connecting part being formed by first prebending the connected parts to one of two predetermined initial positions and by bending about an axis which is essentially parallel to a major axis of the contact part after the associated contact element is received in its associated contact chamber, said contact chambers being arranged with major axes parallel to each other and along at least oen straight line, each contact chamber including a groove leading radially to an outer surface of the insulating body for receiving the middle part of the contact element and wherein the connecting part which is bent to its initial position projects radially out of the groove after the contact element is inserted in its respective contact chamber, the outer surface including specially inclined surfaces for limiting the distance the connecting part may be

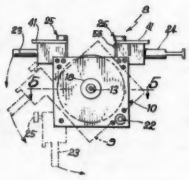
forced during a pressing operation, the inclination of the inclined surface being selected such that the connecting part after being forced against the inclined surface thereafter springs back to its final desired position.

4,603,476

METHOD FOR HANDLING HARNESS WIRE

John W. Tarbox, 13096 Caminito Del Rocio, Del Mar, Calif. 92014

Filed Mar. 8, 1984, Ser. No. 587,455
Int. Cl.[4] H01R *43/04*; B21F *3/00*; B23C *1/00*
U.S. Cl. 29—863 **6 Claims**



1. A method for performing at least in part the preparation of wire for harness forming and the actual forming thereof, utilizing a wire spool cartridge with a leading end gripper which is rotatable about the axis of said spool to wind a wire thereon, said method comprising the following steps:

(a) with a wire loader, engaging the first loaded end of a length of wire in said leading end gripper;

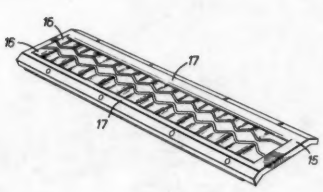
(b) with said loader, spinning said gripper around the axis of said spool until said length of wire is substantially wrapped onto said spool.

4,603,477

SAFETY RAZORS

John F. Francis, Woking, England, assignor to The Gillette Company, Boston, Mass.

Filed Feb. 6, 1985, Ser. No. 698,941
Claims priority, application United Kingdom, Feb. 27, 1984, 8405044
Int. Cl.[4] B26B *21/18, 21/28*
U.S. Cl. 30—50 **5 Claims**



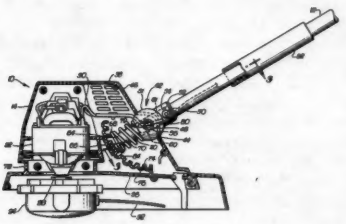
1. A safety razor comprising a pair of opposed blade means having respective sharpened cutting edges directed toward each other with a gap therebetween, each of said sharpened cutting edges being of undulating form so as to have alternating peaks and troughs, wherein each said blade means has a marginal edge portion formed with corrugations extending transversely to the length of the edge and a substantially planar facet intersecting said corrugations over the full depth thereof to define a continuous undulating sharpened cutting edge.

4,603,478

TRIMMER WITH ADJUSTABLE HANDLE

Kenneth K. Anderson, Moorpark, Calif., assignor to Allegretti & Company, Chatsworth, Calif.

Filed Aug. 13, 1984, Ser. No. 639,816
Int. Cl.[4] A01D *55/18*
U.S. Cl. 30—276 **28 Claims**



1. A trimmer, comprising:

a housing;

a motor mounted within said housing;

a handle tube having one end mounted to said housing for pivoted movement with respect to said housing;

a collar mounted for rotation on said housing, said collar having a bore for axially slidably receiving said handle tube, said handle tube being pivotally movable with respect to said housing upon rotation of said collar with respect to said housing;

means for limiting axial sliding movement of said handle tube within said collar; and

means on said housing for releasably locking said handle tube against pivoted movement with respect to said housing at a selected one of a plurality of positions of adjustment; said limiting means

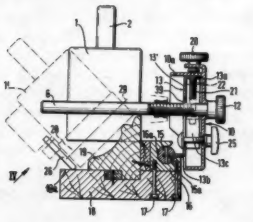
including a bolt for rotatably mounting said collar and said handle tube to said housing, said bolt being inserted through a pair of oppositely facing holes formed transversely in said collar and a pair of oppositely facing axially elongated slots in said handle tube, thereby to permit rotation of said collar and said handle tube with respect to said housing, as well as limited axial movement of said handle tube with respect to said bolt and collar.

4,603,479

GUIDE MEANS FOR MANUAL PLANING TOOLS

Otto Bergler, Mühlacker-Lomersheim, Fed. Rep. of Germany, assignor to Black & Decker Overseas AG, Vaduz, Liechtenstein

Filed May 11, 1984, Ser. No. 609,131
Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318747; Sep. 17, 1983, 3333624
Int. Cl.[4] B27C *1/10*
U.S. Cl. 30—475 **16 Claims**



1. An apparatus for guiding, relative to a workpiece, a hand-

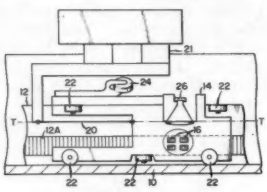
held planing or milling tool of the type having a rotary driven cutter, said apparatus comprising a holder for carrying the tool; first adjustment means for varying the position of the holder relative to the tool; a guide rail fixable in position relative to the workpiece; a running part carried by said holder and movably guided on said guide rail; and second adjustment means for varying the position of said running part relative to said holder, said holder including a web portion having rods projecting therefrom for connection with the tool, said holder including means forming a guide path extending orthogonally to both said guide rail and said rods; a connecting piece connected to said holder and movable adjustably within said guide path; said connecting piece carrying said running part; said holder being arranged for pivoting movement relative to said guide rail, said connecting piece comprising a metal plate including first and second legs and a portion engageable with said means forming a guide path, said second adjusting means comprising an adjusting member mounted on said holder and engageable with said first leg for adjusting the relative position of said connecting piece relative to said holder in two directions; and spring means for opposing adjustment in one of said directions; said second leg carrying said running part.

4,603,48[illegible]

LINEAR SCALE TYPE DISPLACEMENT MEASURING INSTRUMENT

Seiji Sakagami, Kawasaki, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed May 14, 1985, Ser. No. 733,760
Claims priority, application Japan, May 22, 1984, 59-103467
Int. Cl.[4] G01B 11/04
U.S. Cl. 33—125 R 12 Claims



1. A linear scale type displacement measuring instrument comprising: a hollow elongate case extending in a direction of linear movement of relatively movable members and fixed to one of the relatively movable members, said case having a neutral plane including the longitudinal axis of the case; a main scale secured to the inner surface of the case in the longitudinal direction thereof and offset from the longitudinal axis of said case; a carriage connected to the other of the relatively movable members and movable along said main scale in the longitudinal direction thereof; a connecting mechanism connecting said carriage to the other of the relatively movable members; index scale held by the carriage and opposed to the main scale; and a detector for converting a displacement value of relative movement between said main scale and said index scale into an electric signal;

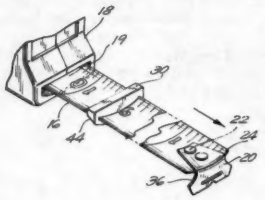
one end of said connecting mechanism being connected to said carriage and the other end of said connecting mechanism being connected to the other of the relative movable members within neutral planes of the case as a whole including said main scale mounted therein, and said connecting mechanism being capable of permitting said carriage to change the posture thereof such that said index scales can be held in states of perpendicularly intersecting the normal line of the surface of a warp of said main scale.

4,603,481

BUMPER INDICATOR

Howard Cohen, Plainview, and Alois Dauer, Middle Island, both of N.Y., assignors to Irwin Measuring Tool Co., Patchogue, N.Y.

Filed Sep. 19, 1984, Ser. No. 652,315
Int. Cl.[4] G01C 3/10
U.S. Cl. 33—138 17 Claims



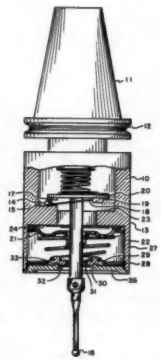
1. A bumper indicator for use with a measuring rule including a casing, a tape having markings thereon wound within the casing for extension and retraction therefrom and including a free end extending from the casing with a tape hook thereon and a tape retraction mechanism for automatically retracting the tape into the casing, said bumper indicator comprising a one-piece resilient bumper having front and rear surfaces and a transverse slit formed therein, said slit having a configuration selected to be generally complementary to the cross-sectional configuration of the tape rule on which it is to be mounted and being dimensioned to frictionally engage the tape rule and remain in a relatively fixed position relative to markings on the tape when the tape rule is extended while slidably receiving the tape rule to permit the tape rule to pass freely therethrough under the influence of the tape retraction mechanism when the bumper is engaged against the casing; said bumper also having top and bottom edges; said rear surface of the bumper facing away from the tape hook and being chamfered from a position below the slit to said bottom edge.

4,603,482

PROBE SHIELD

Robert F. Cusack, Grosse Pointe Park, Mich., assignor to Valeron Corporation, Northlake, Ill.

Filed Dec. 30, 1985, Ser. No. 814,936
Int. Cl.[4] G01B 7/02
U.S. Cl. 33—169 R 4 Claims



1. Touch probe apparatus comprising:

a housing;

a stylus movable with respect to the housing and extending

from a mounting end located within the housing through a first aperture in a front wall of the housing to a stylus contact end located exteriorly of the housing;

the improvement comprising;

an extension of said housing beyond the front wall thereof;

a second front wall including a second aperture through which said probe extends terminating said extension;

a first resilient seal means surrounding said stylus to seal said first aperture against the entry of foreign matter;

a disc including an aperture through which said stylus projects encircling said stylus and located between said first front wall and said second front wall in contact with said second front wall;

and resilient spring means operative to maintain said disc in contact with said second front wall interior surface;

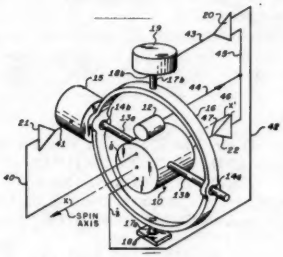
said disc means further ensuring against the entry of foreign matter.

4,603,483

THERMAL GRADIENT COMPENSATOR FOR FLUID ROTOR GYROSCOPIC APPARATUS

Willis G. Wing, Glen Head, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 29, 1984, Ser. No. 666,004
Int. Cl.[4] G01C *19/02*
U.S. Cl. 33—324 **17 Claims**



1. In a gyroscopic apparatus comprising a housing, a fluid mass, means for containing said fluid mass within said housing, drive means for spinning said containing means about an axis thereof, thereby also spinning said fluid mass about a fluid axis, and means communicating with said fluid mass for detecting an angular difference between said spin axis of said fluid and said spin axis of said containing means, the improvement comprising:

means for providing a tilt signal representative of an angular difference between said spin axis of said containing means and an essentially horizontal axis; and

means responsive to said tilt signal for heating said fluid mass to provide a predetermined thermal gradient along said fluid spin axis.

4,603,484

LEVEL SENSING APPARATUS PROVIDING OUTPUT SIGNALS COMPATIBLE WITH DIGITAL APPARATUS

Thomas Strothmann, 5405 S. Camino de la Tierra, Tucson, Ariz. 85746

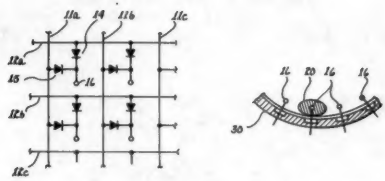
Filed Mar. 4, 1985, Ser. No. 707,747
Int. Cl.[4] G01C *9/06*
U.S. Cl. 33—366 **16 Claims**

1. An electronic level sensor comprising:

a curved surface having a varying radius of curvature;

a conducting material free to move on said curved surface, said conducting material reaching a position on said surface determined by a deviation of said surface from a predetermined orientation;

a plurality of first electrodes having a pre-established relationship with said curved surface, wherein said first electrodes are electrically coupled in a first array, said first electrodes also being coupled in a second array; each of said electrodes of said first array designating a first parameter with respect to said surface position, each of said electrodes of said second array designating a second parameter with respect to said surface position; and



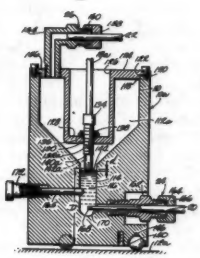
at least one second electrode, said conducting material completing a conducting path between said at least one second electrode and a one of said first electrodes, each of said conducting paths establishing a surface position.

4,603,485

LEVELING APPARATUS

Lyle D. Ostby, Brookfield, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Sep. 23, 1985, Ser. No. 778,788
Int. Cl.[4] G01C *5/04*
U.S. Cl. 33—367 **18 Claims**



6. Apparatus for measuring the vertical difference between first and second generally horizontal surface portions comprising:

a pool of electrically conductive fluid having a first pool portion on said first surface portion and a second pool portion on said second surface portion;

means for establishing a first inductive field adajacent to said first pool portion and a second inductive field adjacent to said second pool portion;

means for sensing said first inductive field at a position located a first distance from the surface level of said first pool portion and generating a first signal representing said first distance;

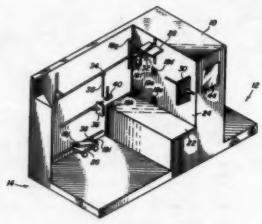
means for sensing said second inductive field at a position located a second distance from the surface level of said second pool portion and generating a second signal representing said second distance; and

means for processing said first and second signals to provide a third signal representing the difference between said first and second distances and the vertical distance between said first and second surface portions.

4,603,486
AUTOMATED ANTHROPOMETRIC DATA MEASUREMENT SYSTEM

William F. Moroney, Chalfont, Pa.; James C. Bartholomew, Burke; Clifford M. Cagle, Reston, both of Va., and Robert E. Hughes, Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1985, Ser. No. 788,371
Int. Cl.[4] A61B 5/10
U.S. Cl. 33—512 6 Claims



1. An anthropometric data measurement system for screening an aviator for subsequent assignment to a particularly suitable aircraft, comprising in combination:

a first measuring assembly for determining the aviator's stature;

a second measuring assembly including a seat, having a seat pan portion and a seat back portion, and a pedal assembly for determining the aviator's sitting height, shoulder height sitting, shoulder width, functional arm reach, buttock-knee length, functional leg reach, and knee height sitting;

a display and control panel for assisting an operator in the correct placement of the aviator and selecting the respective anthropometric feature to be measured;

a positioning aid observable by the aviator for assisting him in maintaining a position required for the respective anthropometric feature to be measured;

system controller means for collecting the measurements determined by said first and second measuring assemblies, comparing the collected measurements to a predetermined set of upper and lower limits, performing data reasonability checks and outputting said collected measurements when they fall within said predetermined set of upper and lower limits; and

archival means for storing the measurements output from said system controller means.

4,603,487
METHOD OF COMPENSATING A PROFILING DIRECTION OF A PROFILING MACHINE

Yuso Matsunata, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 22, 1985, Ser. No. 801,050
Int. Cl.[4] G01B 7/28
U.S. Cl. 33—551 3 Claims

1. In a method of controlling a profiling machine including:

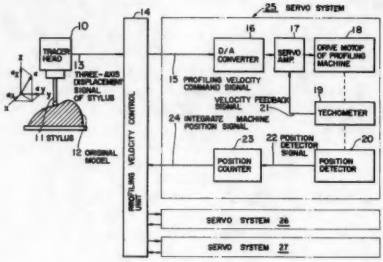
a tracer head capable of tracing an original model and for supplying a displacement signal detected by a stylus to a profiling velocity control unit;

a servo system including a drive system for driving the profiling machine on the basis of a profiling velocity command signal produced from the control unit, a detector for detecting a position of the profiling machine and a machine position counter for integrating an output signal of the detector to supply the integrated signal to the control unit; and

a control unit for calculating the profiling velocity command signal on the basis of the displacement signals for three axes and an output of the counter to supply the command signal to the drive system;

a method of correcting a profiling direction of the profiling machine, comprising steps of:

calculating a distance between a current position of the machine obtained by tracing the model in a plane of axes x and y and an ideal profiling locus in the plane of axes x and y defined by a given profile angle;



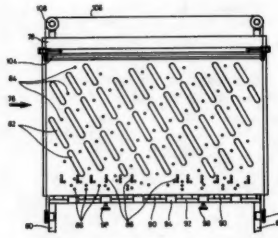
calculating a correction quantity in a moving direction of the profiling machine in the plane of axes x and y on the basis of the distance; and

supplying a velocity command signal on the basis of a corrected moving direction to the servo system from the control unit.

4,603,488
PROCESS AND APPLIANCES FOR THE PRE-SETTING OF CUTTING AND EJECTION TOOLS IN A CUTTING PRESS FOR BOX BLANKS

Jacques Nassoy, 14, rue Capitaine Dumont, St. Quentin, and Bernard Protin, 3, ch. Croix Etienne, F-21600 Sennay, both of France

Division of Ser. No. 345,354, Feb. 3, 1982, Pat. No. 4,510,667.
This application Feb. 15, 1985, Ser. No. 702,330
Claims priority, application France, Feb. 3, 1981, 81 02006
Int. Cl.[4] B23B 49/02
U.S. Cl. 33—562 8 Claims



1. An apparatus for producing centering holes and mounting holes in a cutting form having cutting rules and in at least one ejection board of a platen press, said apparatus comprising a pre-mounting template being provided on its lower edge with a fixed rectilinear stop on which one of the cutting rules of the cutting form is receivable, a horizontal bar with a support surface being mounted on the template adjacent the stop, means for adjusting the support surface relative to the stop, said template having a pair of centering hole guides and a pattern of distributed mounting hole guides so that with a cutting form on the stop, centering holes and mounting holes can be drilled into the cutting form and by positioning a board

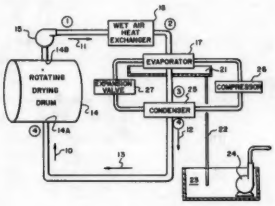
on the support surface, centering holes can be formed that are aligned with the centering holes on the cutting form.

4,603,489

HEAT PUMP CLOSED LOOP DRYING

Michael Goldberg, 118 Page Rd., Bedford, Mass. 01730

Filed Oct. 5, 1984, Ser. No. 657,896
Int. Cl.[4] F26B *21/08*
U.S. Cl. 34—77 **4 Claims**



1. Drying apparatus comprising,

drying chamber means for receiving items to be dried having an air inlet and an air outlet,

heat pumping means comprising evaporating means for allowing refrigerant to evaporate, condensing means for receiving compressed refrigerant, compressing means for compressing evaporated refrigerant from said evaporating means and delivering compressed refrigerant to said condensing means and expansion means for intercoupling said condensing means and said evaporating means to form a closed heat pump system,

means for delivering relatively moist air to said evaporating means for removing moisture therefrom and delivering substantially all the air incident on said evaporating means to said condensing means for delivering heat to said incident air from said condensing means,

means for coupling substantially all the air from said condensing means to the inlet of said drying chamber means to provide heated dehumidified air for removing moisture from items to be dried therein,

means for extracting moist air from said drying chamber means through said air outlet,

means for intercoupling the air outlet of said drying chamber means with the input to said evaporating means,

wet air heat exchanging means coupled to the means for intercoupling said air outlet and evaporating means inlet for withdrawing heat from the moist air passing therethrough and having a heat withdrawing capacity at least equal to the energy input to said heat pumping means,

and blower means for circulating said air through said drying chamber means.

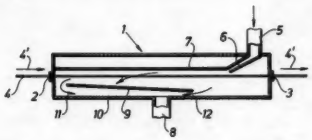
4,603,490

ARRANGEMENT FOR THE TREATMENT OF A MOVING MATERIAL WEB

Anders E. Hilmersson, Helsingborg, and Helge Andersson, Lund, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed May 31, 1984, Ser. No. 615,819
Claims priority, application Sweden, Jun. 3, 1983, 8303139
Int. Cl.[4] F26B *13/02*
U.S. Cl. 34—155 **9 Claims**

1. An arrangement for the treatment of a moving material web comprising a chamber, a web inlet and a web outlet for defining a web path through the chamber, a gas inlet and a gas outlet for a gas flow, said gas outlet being situated at the opposite side of the web path in relation to the gas inlet and a baffle plate extending along said web path between said gas outlet and the web path, the baffle plate being arranged at an angle to said web path, said gas outlet being located in a first wall of said chamber, the ends of the baffle plate defining first and second gas discharge gaps between the baffle plate and said first wall, said first gap being greater than said second gap, said



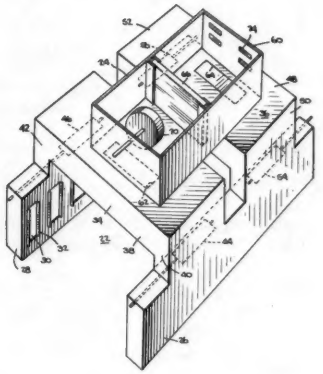
first gap being spaced further from said gas inlet than said second gap, whereby these gaps cause a greater part of the gas flow to pass through said first gap than through said second gap when said material web is moving along said web path.

4,603,491

REVERSIBLE CROSS FLOW DRYING OR CURING OVEN

Robert E. Hengle, and William F. Granfors, both of Cleveland, Ohio, assignors to FECO Engineered Systems, Inc., Cleveland, Ohio

Continuation of Ser. No. 491,716, May 5, 1983, abandoned. This application Dec. 6, 1984, Ser. No. 678,969
Int. Cl.[4] F26B *9/02*
U.S. Cl. 34—191 **4 Claims**



1. A reversible cross flow drying or curing oven comprising:

an oven housing having opposed side walls defining a drying or curing chamber therebetween for receiving articles to be dried or cured,

first and second ducts disposed along the respective opposite side walls of said housing and having openings for supplying air into and receiving air from said oven chamber,

a crossover air supply duct within said oven overlying the curing chamber and connected by supply passageways at opposite ends to said first and second ducts for supplying air thereto,

damper means located between the supply passageways and the first and second ducts,

a crossover air return duct within said oven adjacent the air supply duct overlying the curing chamber and connected by return passageways at opposite ends to said first and second ducts for receiving air therefrom,

a damper means located between the return passageways and the first and second ducts,

a cupola housing overlying the air supply and air return ducts, said cupola defining a chamber for receiving return

air from the return duct, having means for conditioning the return air, and means for recirculating the air to the air supply duct for return to the curing chamber,

and means for periodically opening and closing an air supply damper and an air return damper to periodically reverse the flow of air across said oven chamber.

4,603,492

INSERT CONTAINER FOR FREEZE-DRYING PLANTS

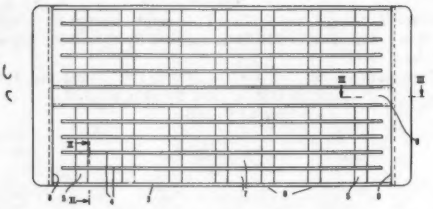
Klaus D. Koch, Bremen; Johann Brunssen, Osterholz-Scharmbeck, and Helmut Sieling, Hambergen, all of Fed. Rep. of Germany, assignors to HAG GF Aktiengesellschaft, Bremen, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,800

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413856

Int. Cl.[4] F26B *25/10, 5/06, 13/30*

U.S. Cl. 34—237 3 Claims



3. An insert container for freeze-drying plants comprising two opposed end walls (8), two opposed side walls (3) and a plurality of vertical ribs subdividing the insert container into parallel compartments, characterized by:

(a) vapor-pervious tubes (5) extending transversely of the traversing the ribs (4);

(b) said side walls (3) provided with depressions; and

(c) contacting side walls (3) of two adjacent insert containers (1) forming a channel (12) for discharge of water vapor.

4,603,493

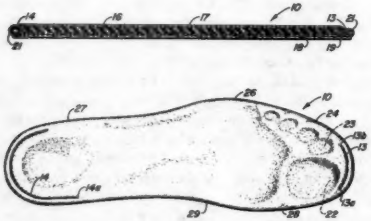
INSOLE WITH MOLDABLE MATERIAL

Gary A. Eston, 352 Bofin, Foster City, Calif. 94404

Filed Sep. 24, 1984, Ser. No. 653,569

Int. Cl.[4] A43B *13/40*

U.S. Cl. 36—44 14 Claims



1. An insole for an item of footwear having a medial and a lateral side and comprising:

a shoeboard having a profile which generally conforms to the outline of the foot of a wearer and flexible to bend with the footwear item;

a soft, flexible innersole piece above the shoe board;

a mass of flexible, moldable, nonsetting material contained between the shoe board and the innersole piece, for causing the innersole piece to conform to the bottom of the foot of a wearer of the footwear;

connection means for securing the shoe board and the innersole piece together so as to contain and seal the nonsetting material between them, comprising an overlap of the innersole piece over the shoe board around its periphery, the overlap being tucked under the shoe board and glued to the underside thereof, and stitching from the innersole down through the shoe board, the stitching being inward a short distance from the edge of the insole and being in one general arc in front of the wearer's first toe and in another generally arcuate pattern at the heel, thereby preventing the moldable nonsetting material from excessive molding and migration beyond the stitching in those locations;

the innersole piece being free of stitching at the forefoot on either side of the ball of the foot, and at the cuboid bone at the lateral midfoot back to just forward of the heel, whereby the nonsetting material is allowed to mold and flow out to the periphery of the insole in these areas.

4,603,494

NON-SKID IRONING BOARD COVER

David Lehrman, c/o The Ironees Company, Front & Venango St., Philadelphia, Pa. 19134

Filed Mar. 15, 1985, Ser. No. 711,683

Int. Cl.[4] D06F *83/00*

U.S. Cl. 38—140 11 Claims

1. A cover for an ironing board or pressing machine which has an ironing surface and side skirts when covering the ironing board or pressing surface of the pressing machine and comprises a fabric at least a portion thereof having a coating of an acrylic polymer composition which (1) provides a non-skid surface at room temperature, (2) prevents the article being ironed or pressed from falling off the ironing or pressing surface, and (3) is stable at ironing or pressing temperatures.

4,603,495

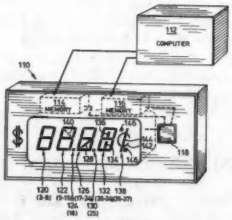
ALPHANUMERIC DISPLAY MODULES

John K. Stevens, 8 Alexander Street, Brampton, Ontario, Canada L6V 1H6

Filed Sep. 19, 1984, Ser. No. 652,039

Int. Cl.[4] G09F *3/04*

U.S. Cl. 40—451 13 Claims



1. An alphanumeric display module comprising at least four display cells which from left to right as viewed by an observer are:

(a) first and second cells which are figure eight cells having seven selectable elements, each cell having two spaced vertical sides each of two elements disposed one above the other, having horizontal top and bottom sides each of one element, and having a horizontal cross-bar of one element disposed between the top and bottom elements;

(b) a third cell which is a figure eight cell having in addition a right upwardly inclined diagonal selectable element from the bottom left corner of the cell to the upper right

corner at the junction of the cross-bar element and the lower right vertical element;

(c) a fourth cell which is a figure eight cell having in addition two additional equal vertical selectable elements extending from top to bottom of the cell one above the other parallel to the vertical side elements and at least approximately midway between the vertical side elements; and

(d) respective electric control leads connected to the cell elements for selective energization thereof;

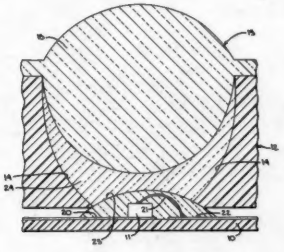
the display module including in addition a fifth cell to the right of the fourth cell, as viewed by an observer, the fifth cell comprising an upward right inclined oblique stroke element, a pair of simultaneously controllable period elements which together with the oblique element constitute a percentage sign, and a C-shaped element straddling the oblique element and constituting therewith a cents sign, and respective electric control leads connected to the oblique element, the pair of period elements and the C-shaped element for selective energization thereof.

4,603,496

ELECTRONIC DISPLAY WITH LENS MATRIX

William J. Latz, New Berlin; Thomas J. Mandler, Grafton, both of Wis., and Jason C. S. Lai, Taipei, Taiwan, assignors to Adaptive Micro Systems, Inc., Butler, Wis.

Filed Feb. 4, 1985, Ser. No. 698,021
Int. Cl.[4] G09F *13/00*
U.S. Cl. 40—547 **3 Claims**



1. An electronic display which comprises:

a printed circuit board having a plurality of light emitting devices mounted to its front surface and arranged in a pattern;

a reflector matrix disposed over the front surface of the printed circuit board and having a plurality of openings formed therethrough which are aligned with the light emitting devices in said pattern to provide a light pipe which extends forward from each light emitting device, each said light pipe being concave opening away from the light emitting device with a smaller open end adjacent to the printed circuit board and a larger open end opposite from the printed circuit board;

a lens matrix disposed over the front surface of the reflector matrix and having a plurality of lenses which are aligned with the light pipes in said pattern to provide a lens over the forward end of each light pipe, each said lens having front and rear convex surfaces, said rear convex surface extending into the corresponding light pipe and filling the larger opening of the light pipe;

a potting compound filling each light pipe between the printed circuit board and the lens matrix; and

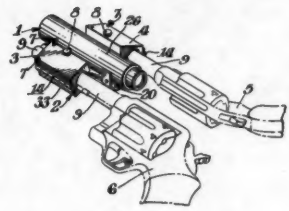
wherein the side surfaces of said potting compound contact and are defined by the light pipe and the front surface of the potting compound contacts and is defined by the lens.

4,603,497

MEANS FOR SECURING AND ALIGNING THE BARRELS OF TWO PISTOLS SUBSTANTIALLY PARALLEL

Arthur G. Crimmins, Jr., Tillamook, Oreg., assignor to Joan M. Crimmins, Lansdale, Pa.

Filed Mar. 5, 1984, Ser. No. 586,207
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—106 **4 Claims**



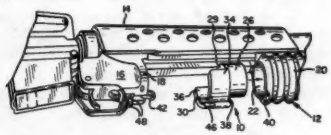
1. The combination, with two conventional pistols, each having a barrel, a hand grip and a trigger, of means, comprising a support member fixedly securing both pistols in substantially parallel alignment whereby each pistol is aimed at substantially a single point on a target by an operator using one hand on one hand grip and the other hand on the other hand grip, permitting manipulation of the trigger of each pistol for simultaneous or successive firing.

4,603,498

EXTERNALLY VISIBLE SAFETY DEVICE FOR GRENADE LAUNCHER

David A. Johnson, 3432 Tanglewood Way, Salem, Oreg. 97302

Filed Oct. 4, 1985, Ser. No. 784,526
Int. Cl.[4] F41C *17/08*; F41F *1/00*
U.S. Cl. 42—105 **14 Claims**



13. In combination with a breech loading firearm including structure defining a firing chamber for receiving a cartridge to be fired, said firing chamber defining a breech opening, and said firearm further including a breech block for selectively closing said breech opening and structure defining a passageway communicating in a radial direction between the interior of said firing chamber and the exterior of said firearm when said breech is closed by said breech block, an externally visible safety device, comprising:

(a) chamber plug means of a size which fits within said firing chamber, for preventing entry of a cartridge into said firing chamber;

(b) an indicator located in a position visibly exposed externally of said firearm; and

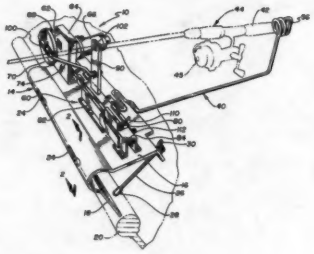
(c) connector means extending between said chamber plug and said indicator, for connecting said chamber plug with said indicator, said connector means being of a size and shape which fits within said passageway, and being small enough not to interfere with the closing of the breech of said firing chamber structure by said breech block.

4,603,499

HORIZONTAL FISHING ROD MOTION CONTROL

Anthony Simborski, 14140 Germanium St. NW., Anoka, Minn. 55303

Filed Jul. 1, 1985, Ser. No. 750,926
Int. Cl.[4] A01K 97/10
U.S. Cl. 43—19.2 11 Claims



1. A motor driven trolling device comprising:

(a) a frame, including means for mounting said frame to a gunwale of a boat,

(b) motor driven crank means for providing rotation to a crank, said means being mounted to said frame and including a motor means providing rotation to a crank of said crank means;

(c) slider means journaled to said frame and being constructed and arranged such that a slider bar of said means may move back and forth in a straight line, said slider bar further including a lever means extending vertically from said slider bar, said lever means including a pivot link for attachment to a connecting rod pivotally linked to said crank means and lever means such that movement of said crank creates rectilinear movement of said slider bar, said lever means further including shaft holder means for releasably holding a shaft of a fishing rod thereto; and

(d) fishing rod butt holder means for securing a butt end of a fishing rod to said butt holder means, said means including a rod holder detachably affixed at one end to said frame and having a fishing rod butt end receiving means at the other end such that a fishing rod may be held approximately perpendicularly to said slider bar by said butt end receiving means and shaft holder means so that rotation of said crank causes the free end of a fishing rod so held to move back and forth with said slider bar.

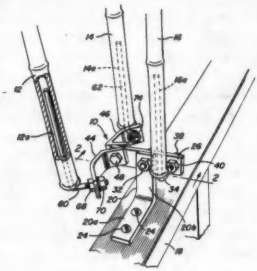
4,603,500

FISHING POLE HOLDER

James A. Harrison, Sr., Rte. 1, Box 757-J, Bartow, Fla. 33830

Filed Oct. 26, 1984, Ser. No. 665,731
Int. Cl.[4] A01K 97/10
U.S. Cl. 43—21.2 9 Claims

1. A fishing pole holder comprising a plurality of elongate pole pins for receipt in corresponding longitudinally extending bores formed from the butt ends of respective fishing poles, and articulated support means for mounting the pins in upright angularly adjustable positions on a suitable support such as the rail of a fishing boat or the like, wherein each pole pin has an elongate portion for receipt in a respective bore, a base portion bent at an angle to the elongate portion, and means for securing the base portion to the support means for angular adjustment of the respective pin about the axes of the base portion, wherein the support means comprises a bar, means for supporting the bar in substantially horizontal position, means for pivotally securing the elongate portion of a first pole pin at one end of the bar, a pair of transversely extending brackets at the other end of the bar, and means for pivotally securing the elongate



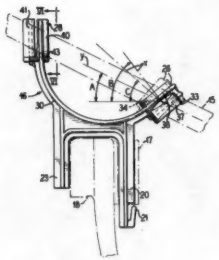
portions of second and third pole pins to the respective brackets.

4,603,501

OAR LOCK POLE HOLDER

Donald C. Radcliff, 850 S. Lorraine Rd., Wheaton, Ill. 60187

Filed Jan. 24, 1985, Ser. No. 694,293
Int. Cl.[4] A01K 97/10
U.S. Cl. 43—21.2 9 Claims



1. A fishing rod support for retaining and positioning a fishing rod in a desirable orientation for catching fish comprising:

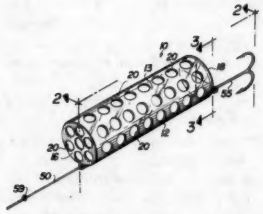
a mounting means to detachably mount said fishing rod support in a desired location;

a support loop means being of a sufficient size to freely receive a fishing rod handle therein, and including offset diametrically opposed gripping areas;

a forked rest means spaced from said support loop means and adapted to cradle an extending portion of said fishing rod handle at a predetermined inclined angle; and

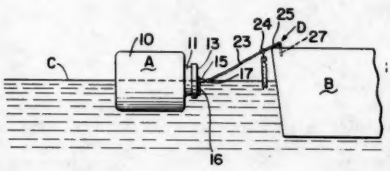
means to interconnect said support loop means and said forked rest means in an aligned and predisposed angular relationship relative to one another, said support loop means comprises a pair of semi-circular portions interconnected in an axial offset orientation thereby defining said opposed gripping areas and having an axis extending at an inclined angle substantially greater than said predetermined inclined angle, whereby when said fishing rod handle is inserted into said support loop means and said extending portion of said handle is cradled by said forked rest means at said predetermined inclined angle, said opposed gripping areas of said support loop means make gripping contact with said fishing rod handle.

4,603,502
FISHING LURE ASSEMBLY
Richard MacDonald, Naples, Fla., assignor to Margaret H. MacDonald, Naples, Fla.
Filed Nov. 14, 1985, Ser. No. 798,045
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—41 **15 Claims**



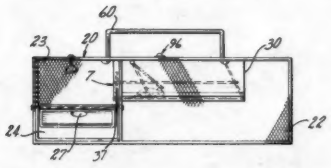
1. A fishing lure structure of the type primarily designed to retain and display a live bait fish substantially adjacent a hook assembly for the attraction of a larger fish thereto, said assembly comprising:
(a) a housing having a substantially elongated configuration and a hollow interior portion extending along the length thereof, said hollow interior portion defining a chamber in which the bait fish is retained,
(b) said chamber including both a transverse and longitudinal dimension sufficient to retain and allow free movement of the live bait fish therein,
(c) said housing further including an elongated, lateral wall disposed in surrounding relation to said chamber,
(d) said housing having two end walls formed at opposite ends of said lateral wall and disposed in substantially tranverse relation to the length of said housing,
(e) resiliently segmented entrance means for providing access into and out of said chamber being formed on and at least partially defining one of said end walls, said entrance means structured to facilitate entrance into said chamber and resist exiting therefrom,
(f) said lateral wall formed from a transparent material, whereby said bait fish is displayed, and including a plurality of apertures formed in said lateral wall, said plurality of apertures disposed and dimensioned to allow water to fill said housing and freely flow into and out of said chamber, and
(g) connecting means secured to said housing for attachment of said lure assembly to a fishing line.

4,603,503
PORTABLE BAIT CONTAINER
James P. Haney, 340 Park Dr., Canonsburg, Pa. 15317
Filed Sep. 13, 1985, Ser. No. 775,813
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—56 **14 Claims**



1. A portable bait container that is floatable on its side within a body of water which comprises, an elongated floatable body for carrying live bait in water therein, said body having an open end portion, a lid mounted on said open end portion, said lid having water and air circulating hole portions and a bait inserting and removing open portion in a balanced relation in a lower half portion thereof, a closure member carried by said lid for opening and closing movement with respect to said open portion, and said lid being weighted when said closure member is in a closed position with respect to said open position to align the lower half portion of said body in a substantially longitudinally floatable relation within the body of water.

4,603,504
MOUSETRAP
Orestes L. Llanos, 3330 NW. 99th St., Miami, Fla. 33147
Filed Mar. 25, 1985, Ser. No. 715,915
Int. Cl.[4] A01M *23/04, 23/06*
U.S. Cl. 43—76 **3 Claims**



1. A trap for rodents, comprising:
A. a housing covered by mesh wire of suitable characteristics to keep the animal in while at the same time allows it to see through said housing walls;
B. an entrance compartment defined within said housing having an entrance and an exit;
C. an off-center balance member positioned within said entrance compartment and having adequate dimensions to fit exactly within said entrance compartment, and said member having sufficient weight means mounted to its shorter portion so that it overcomes the opposite longer portion thereby keeping said entrance open in the normal position and closing it when the animal walks in past the center of said balance member;
D. a one-way tunnel compartment connected to said exit so that said animal can go through it when said balance member is in the closed position, and said tunnel including a first door adjacent to said exit and second one-way door at a point sufficiently beyond said first door to allow the animal within both doors;
E. latch means for holding said balance member in closed position and releasable by said animal as it moves said second one-way door and said latch means includes an upwardly extending latch member pivotally mounted on the side edge of said balance member that is closer to said tunnel and said second one-way door further includes an elongated linkage arm that extends towards said latch member and engageable with it to maintain said balance member in closed position and capable of releasing it when said second one-way door is moved by the animal thereby resetting said balance member; and
F. storage compartment means connected to said second one-way door so that animals may be accumulated therein as they go through said second door.

4,603,505
PORTABLE ELECTRONIC INSECT CONTROLLER
Lance Millard, 2820 E. 36th Ct., Des Moines, Iowa 50317
Filed May 26, 1983, Ser. No. 498,925
Int. Cl.[4] A01M *1/22, 1/04*
U.S. Cl. 43—112 **15 Claims**

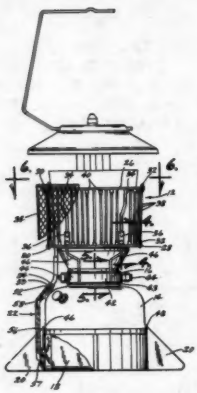
1. A portable electronic insect controller, comprising:
an electrified grid means being alternately polarized with a

high voltage in association with a light producing camping lantern for electrocuting insects when they move within close proximity of the grid;

a power supply means for supplying a controlled source of electrical energy to the grid;

a base for supporting the camping lantern and housing the power supply means;

said grid means including a bottom and top ring, said rings being substantially parallel to each other, spaced apart and



including bars, said bars extending upward from the bottom ring and downward from the top ring in a spaced arrangement and electrically isolated from each other;

said grid means further including a grid bracket, said bracket engaging the rings and the lantern to securely hold the rings and bars in a fixed position; and

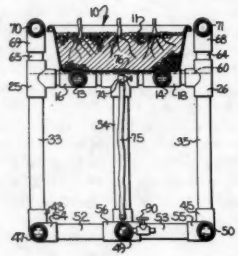
a safety interconnect means for electrically connecting the power supply means to the grid means and preventing the refueling of the lantern without disconnecting the grid means from the power supply means.

4,603,506

HYDROPONIC PLANT GROWING DEVICE

George P. Powell, Jr., 205 Brandywine Rd., Charlotte, N.C. 28209

Filed Nov. 5, 1984, Ser. No. 668,574
Int. Cl.[4] A01G *31/00*
U.S. Cl. 47—62 **9 Claims**



1. A hydroponic plant growing device comprising

a rectangular plant growing tray including side and end walls, a bottom wall, and an open top, said plant growing tray being adapted to contain an inert aggregate providing a plant growing bed in which the root system of the plants is embedded,

a tubular support frame positioned beneath said plant growing tray and providing a support for retaining said plant growing tray in a horizontal position thereon, said tubular support frame including spaced-apart upper tubular horizontal frame members on which said bottom wall of said plant growing tray is supported, spaced-apart lower tubular horizontal frame members, and vertical tubular frame members having upper and lower ends communicatively connected to the corresponding upper and lower tubular horizontal frame members, said tubular frame members collectively defining a closed storage chamber containing a fluid growing solution, said storage chamber containing a sufficient volume of growing solution to fill but not overflow said plant growing tray,

fluid growing solution drain and supply tube means communicatively connected between said bottom wall of said plant growing tray and said tubular frame members defining said storage chamber,

pressurized air supply means communicatively connected with said fluid growing solution storage chamber, and

control means operatively associated with said pressurized air supply means and being operable to activate said pressurized air supply means and force the fluid growing solution from said fluid growing solution storage chamber and upwardly through said drain and supply tube means into said plant growing tray, said control means also being operable to deactivate said pressurized air supply means and permit the fluid growing solution to drain from said growing tray and back through said fluid growing solution drain and supply tube means and into said tubular frame members defining said fluid growing solution storage chamber.

4,603,507

MULTI-TIER MULTI-UNIT POT HANGER ASSEMBLY

Paul W. Nelson, 28108 Mountain Meadow Rd., Escondido, Calif. 92026

Filed Feb. 5, 1981, Ser. No. 231,590
Int. Cl.[4] A47G *7/02*
U.S. Cl. 47—67 **5 Claims**

1. A multi-tier multi-unit pot hanging assembly for hanging a plurality of planter pots in a vertically tiered arrangement comprising in combination:

a first hanger member for hanging from an overhead rack, and at least one second hanger member for hanging from said first hanger member;

said first hanger member defined by a first loop having, a first horizontal arm integral with and extending outwardly from one side of said first loop, and an upwardly extend-

ing first vertical arm extending upward from the outer end of said first horizontal arm at an angle of less than 90 degrees to the plane of sid first loop and having a first hook at the upper end thereof terminating at a point coaxial of said loop and adapted to hook over an overhead rail, said first loop extending outward from said first horizontal arm in a horizontal plane for receiving and supporting a planter pot in an upright position; and

said second hanger member defined by a second loop having an upwardly extending second vertical arm extending upwardly from one side of said loop at an angle of less than 90 degrees to the plane of said second loop for supporting said second loop in a horizontal plane for receiving and supporting a planter pot in an upright position and said second vertical arm terminating in a second hook at the upper end at a point substantially coaxial of said second loop for hooking on the outwardly extending first horizontal arm of said first hanger member and thereby position said second loop offset from the axis of said first loop.

4,603,508

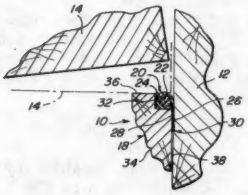
WEATHER STOP

Robert C. Gunther, 292 Rose Ave., Staten Island, N.Y. 10306

Filed Jun. 10, 1985, Ser. No. 743,311

Int. Cl.[4] E06B *7/16*

U.S. Cl. 49—493 **6 Claims**



1. A weather stop, mounted to a jamb of a door which comprises:

(a) a door stop having a side surface facing the door against which the door directly abuts, a perpendicular side facing the jamb, a square groove at the corner between said two sides disposed where said door stop meets said jamb and said door, and

(b) a cylindrically shaped resilient weather strip seated into said square groove and protruding beyond both said side surfaces for providing a snug weather proof seal both against the jamb and the door, means for securing said weather strip in said groove so that when the door is closed into the protrusion facing the door, a tight seal is formed with the door and the protrusion facing the jamb forms a tight seal around the jamb.

4,603,509

MAGNETIC ATTRACTION SYSTEM GRINDING METHOD

Masanori Kunieda, Tokyo; Hiromichi Hiramatsu; Toshiro Higuchi, both of Yokohama, and Takeo Nakagawa, 223-4 Ichinotsubo, Nakahara, Kawasaki, all of Japan, assignors to Aida Engineering, Ltd., Sagamihara and Takeo Nakagawa, Kawasaki, both of, Japan

Filed Feb. 13, 1984, Ser. No. 579,877

Claims priority, application Japan, Mar. 4, 1983, 58-35612

Int. Cl.[4] B24B *1/00*

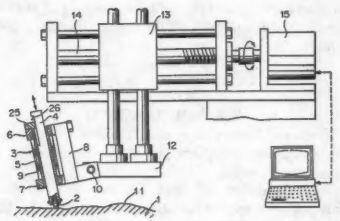
U.S. Cl. 51—31 **19 Claims**

1. A magnetic attraction system grinding method comprising:

providing a grinding tool having a movable magnetic circuit forming means with an end juxtaposed with respect to a workpiece;

providing a magnetic material bonded grindstone on the end of the magnetic circuit forming means;

contacting the grindstone with the surface of the workpiece to be ground;



producing a magnetic circuit by the magnetic circuit forming means between the grinding tool and the workpiece to generate a grinding pressure of the grindstone on the surface to be ground; and

producing relative movement between the grinding tool and the surface to be ground while maintaining said grinding pressure.

4,603,510

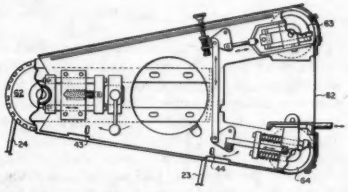
MULTIPLE POSITION BELT GRINDER

Aaron P. Rasmussen, 9606 Candy La., La Mesa, Calif. 92041

Filed Aug. 27, 1984, Ser. No. 644,392

Int. Cl.[4] B24B *21/20*

U.S. Cl. 51—148 **15 Claims**



1. A belt grinder comprising:

a base, a pair of longitudinally spaced support members extending upwardly from said base, said support members having aligned apertures in them that define a major longitudinal pivot axis;

a power train housing positioned between said upwardly extending support members, said housing having an axis of rotation;

means for pivotally mounting said housing to said upwardly extending support members with the axis of rotation of said housing being in alignment with said major longitudinal pivot axis of said support members;

a machine head assembly having a bottom frame that is attached to the top of said housing, a drive wheel and at least two idler wheels supported at predetermined spaced positions on the top surface of said bottom frame member, a closed loop abrasive belt passing around the outer periphery of said drive and idler wheels, said drive wheel and two idler wheels defining a belt line geometry that determines the path for said closed loop abrasive belt to pass from said drive wheel to a first one of said idler wheels, from one of said idler wheels to another of said idler wheels, and from said another of said idler wheels to said drive wheel said belt lines between said drive wheel and said idler wheels forming an angle there between:

means for maintaining said angle substantially constant while said belt line between said idler wheels moves substan-

tially parallel to its starting position during adjustments of said idler wheels nearer to and farther from said drive wheel responsive to decreases and increases in the length of said closed loop abrasive belt due to stretching and changing temperatures;

means for pivoting said power train housing substantially through 360 degrees; and

means for locking said power train housing at predetermined positions throughout its 360 degree range of pivotal motion.

4,603,511

GRINDING ROBOT

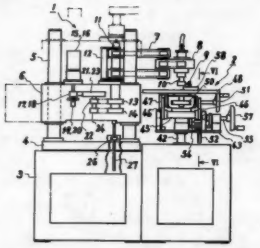
Isamu Komatsu, Sagamihara, and Kenkichi Serizawa, Yamato, both of Japan, assignors to Aida Engineering Limited, Sagamihara, Japan

Filed Oct. 22, 1984, Ser. No. 663,700

Claims priority, application Japan, Nov. 15, 1983, 58-214661; Dec. 28, 1983, 58-245973; Dec. 31, 1983, 58-246443

Int. Cl.[4] B24B *49/00*

U.S. Cl. 51—165.71 **5 Claims**



1. A grinding robot having an abrasive tool for conducting the grinding work on a workpiece, and having a table device for holding the workpiece, and having a playback system to grind a three-dimensional curved-surface, comprising:

a first arm being horizontally oscillatable around a vertical axis portion; said first arm having a head;

a second arm pivoted to, and horizontally oscillatable to, said head of said first arm; said second arm having a head;

a fluid cylinder attached perpendicularly to said head of said second arm;

an abrasive tool attached to a bottom portion of said fluid cylinder for free movement in an ascendable direction and in a descendable direction, said abrasive tool being turnable relative to said bottom portion of said fluid cylinder.

4,603,512

APPARATUS FOR LAPPING A FACET ON A TIP OF A WORKPIECE

Eric F. Cave, Indianapolis, Ind., and James J. Cowden, Beverly, Mass., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 24, 1984, Ser. No. 685,723

Int. Cl.[4] B24B *9/16*

U.S. Cl. 51—229 **8 Claims**

1. An apparatus for lapping a facet on a tip of a workpiece by setting said tip down on a surface of a rotating scaife comprising:

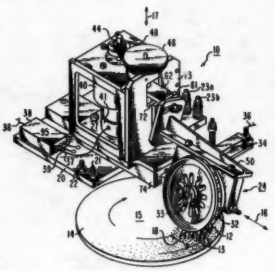
(a) a platform positioned in fixed relation adjacent said scaife;

(b) means connected to said platform for movable supporting a carriage for reciprocal movement in a horizontal direction parallel to a first generally horizontal axis and in a vertical direction that is parallel to a second axis substantially orthogonal to said first axis;

(c) turret means for carrying one or more of said workpieces rotatable about another axis to sequentially position a workpiece over said surface, pivotal means connecting said turret means to said carriage to pivot said turret means about said first generally horizontal axis;

(d) said pivotal means including adjustable torque means for setting the tip of a selected workpiece on said scaife surface at an angle as said carriage is moved in a downward vertical direction, and for controlling the pressure applied to said tip as it is passed against said scaife surface;

(e) sensing means connected to said carriage for sensing an



angular displacement of said workpiece holder about said first axis relative to a predetermined reference position and for generating a displacement signal indicative for said angular displacement; and

(f) means responsive to said displacement signal for lifting said carriage thereby to lift said workpiece tip from the surface of said scaife when said tip has been provided with a facet having a predetermined angle corresponding to said angular displacement.

4,603,513

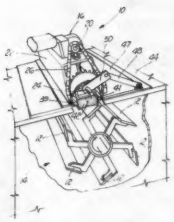
MOTOR DRIVEN FEED SHARPENER

Charles J. Murphy, R.R. #4, Abilene, Kans. 67410

Filed Nov. 28, 1984, Ser. No. 675,957

Int. Cl.[4] B24B *3/36*

U.S. Cl. 51—250 **6 Claims**



1. A motor driven feed sharpener for sharpening feed chopping knives and the like mounted on a feed chopper, the sharpener comprising:

a drive motor connected to a drive shaft, the motor mounted on a sharpener housing;

a stoneholder shaft connected to the drive shaft and rotated thereby, the stoneholder shaft extending along the length of the top of the stoneholder and having a cam mounted thereon;

a tubular stoneholder slidably mounted in the sharpener housing, the stoneholder having an elongated sharpening stone mounted on the bottom thereof, the cam disposed inside the stoneholder and engaging the stoneholder for raising and lowering the holder in the sharpener housing; and

a mounting plate disposed above the feed chopping knives,

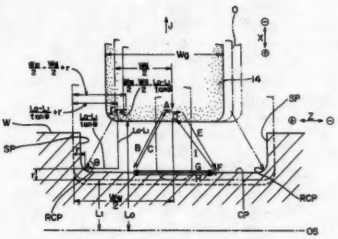
the mounting plate receiving the sharpener housing thereon, the mounting plate having an elongated opening therein for receiving the bottom of the stone when the stoneholder is lowered by the cam.

4,603,514

METHOD OF GRINDING A WORKPIECE HAVING A CYLINDRICAL PORTION AND SHOULDER PORTIONS

Ikuo Suzuki, Chiryu, and Yukio Oda, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 1, 1985, Ser. No. 697,441
Claims priority, application Japan, Feb. 17, 1984, 59-27235
Int. Cl.[4] B24B *1/00, 19/12*
U.S. Cl. 51—281 C **6 Claims**



1. A method of grinding a workpiece having a cylindrical portion and a couple of shoulder portions extending at right angles from the opposite ends of said cylindrical portion, said method comprising the steps of:

(a) rotating said workpiece about the axis of said cylindrical portion;

(b) rotating a cylindrical grinding wheel with a width smaller than the space between said shoulder portions, about an axis parallel with the axis of said cylindrical portion;

(c) effecting relative movements between said grinding wheel and said workpiece along a first oblique path inclined to one direction with respect to the rotational axis of said cylindrical portion by simultaneously moving said grinding wheel and said workpiece respectively in radial and axial directions of said cylindrical portion, so as to simultaneously grind one of said shoulder portions and a part of said cylindrical portion; and

(d) effecting relative movements between said grinding wheel and said workpiece along a second oblique path inclined to the other direction with respect to the rotational axis of said cylindrical portion by simultaneously moving said grinding wheel and said workpiece respectively in said radial and axial directions, so as to simultaneously grind the other of said shoulder portions and another part of said cylindrical portion.

4,603,515

VACUUM BLAST ADAPTER FOR BOMBS

Robert L. Gilmore, Las Vegas, Nev., and George E. Lander, Bolling AFB, D.C., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

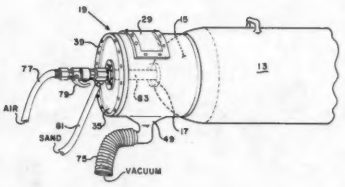
Filed Dec. 22, 1980, Ser. No. 219,397
Int. Cl.[4] B24C *9/00*
U.S. Cl. 51—424 **3 Claims**

1. A vacuum blast adapter for use with an air/abrasive carrying line for removing corrosion from the interior of a bomb booster well, the interior of the bomb booster well being exposed to surrounding ambient air by a booster well opening, said vacuum blast adapter comprising:

a body portion of substantially cylindrical configuration;

an annular rubber seal on the forward end of said body portion for contacting the outer surface of said bomb booster well adjacent said bomb booster well opening and providing a vacuum type seal between said bomb booster well and said body portion of said adapter;

means on the rearward end of said body portion for permitting the sealable insertion of said air/abrasive carrying line therethrough in order for said air/abrasive carrying line to protrude through said body portion and into said interior of said bomb booster well in order to guide abrasive into the interior of said bomb booster well, said sealable insertion permitting means including an annular rubber seal positioned against the rearward end of said body portion, a large plastic disc with a central cut out therein positioned against said annular seal, a pair of smaller plastic discs having central cut outs therein positioned one on each side of said large plastic discs, a rubber disc having a small opening therein positioned between one of said small plastic discs and said large plastic disc, and a metal flange pressed tightly against said large plastic disc with said rubber seal providing a vacuum



tight seal therebetween, said air/abrasive carrying line being positioned through the small opening in said rubber disc;

a transparent window disposed in the upper surface of said body portion, said window being vacuum-tightly sealed to prevent the entrance of said ambient air into the interior of said body portion, thereby allowing the close observation of said insertion of said air/abrasive carrying line into said bomb booster well opening and the observation of the entire vacuum blasting operation; and

means for recovering all of the used abrasive from said body portion for reuse, said abrasive recovering means including a cut out portion in the lower surface of said body portion of said adapter, an abrasive recovery funnel with the larger end thereof fixedly attached adjacent said cut out portion, and a vacuum line attached to the smaller end of said funnel for drawing the used abrasive out of said body portion of said adapter thereby preventing any of the abrasive from escaping into said ambient air surrounding said body portion of said adapter.

4,603,516

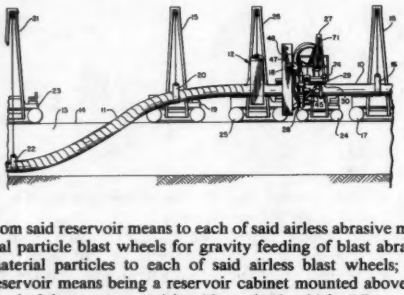
SELF PROPELLED PIPE BLAST CLEANER CAPABLE OF TRAVEL ALONG A PIPELINE SUPPORTED OVER THE DITCH

Joseph H. Hoffman, Plano, Tex., assignor to Resource Engineering and Manufacturing Corp., Tulsa, Okla.

Filed Apr. 2, 1984, Ser. No. 595,661
Int. Cl.[4] B24C *3/06*
U.S. Cl. 51—425 **20 Claims**

1. A self propelled pipe blast cleaner capable of travel along a pipeline supported over a ditch comprising: a self propelled cart with support rollers for movement along the top of the pipe of the pipeline being blast cleaned; variable speed drive means on said cart for driving said cart along the pipe including rollers of said support rollers; a blast cabinet mounted on said cart and surrounding said pipe for blast cleaning work along said pipe; a plurality of airless abrasive material particle blast wheels contained within said blast cabinet for abrasive material particle blast cleaning of the outer surface of said pipe as said cart is propelled along said pipe; and a blast abrasive material particle reclaiming and circulation system including a reservoir for feeding abrasive material particles to the airless

blast wheels; wherein said blast cabinet surrounding the pipe has front and rear openings for passage of the pipe therethrough; wherein a first seal structure including a first seal housing is provided at said front opening and a second seal structure including a second seal housing is provided at said rear opening in said blast cabinet; said seal structures bridging on opening gap between the cabinet and the outer surface of the pipe, respectively, at each of said front and rear openings; said reclaiming and circulation system including abrasive material particle elevator means with elevator housing means mounted on said cart and extending generally from the lowermost extent of the self propelled pipe blast cleaner to the top thereof; piping passage means extending from the bottom of said blast cabinet downwardly to the bottom of said elevator housing means for passage of abrasive material particles that fall to the bottom of the blast cabinet to the bottom of said elevator housing means; said reservoir being mounted below the top of said elevator means and in communication with said elevator means for delivery of abrasive particles lifted by said elevator means to said reservoir means; and a feed line means



from said reservoir means to each of said airless abrasive material particle blast wheels for gravity feeding of blast abrasive material particles to each of said airless blast wheels; said reservoir means being a reservoir cabinet mounted above the level of the uppermost airless blast wheel; said feed line means including a plurality of gravity flow feed lines, one line extended to each airless blast wheel from the bottom of said reservoir cabinet; an air wash gravity type separator in the upper portion of said reservoir cabinet with air flow inlet means and air suction outlet means; said blast abrasive material particle reclaiming and circulation system being a substantially sealed system including said blast cabinet so that said air suction outlet means draws a vacuum lowering the pressure below atmospheric pressure within the particle reclaiming and circulation system in addition to drawing air input from said air flow inlet means for the air wash gravity type separator; and wherein said abrasive material particle elevator means includes two opposite side vertical elevators each with a housing enclosing a bottom driven belt and belt mounted cup type elevator.

4,603,517
CORNER PATCH SUPPORT
George W. Lyons, Jr., Madison, Conn., assignor to The Bilco Company, New Haven, Conn.
Filed Jan. 18, 1985, Ser. No. 692,529
Int. Cl.[4] E04D *13/14*
U.S. Cl. 52—60 **7 Claims**

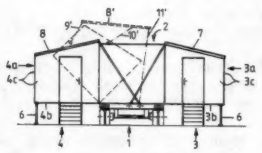
1. A corner patch support for heat sealable plastic patches used to cover corner base gaps arising from the use of flashing applied to the intersection of a planar surface with the walls of a housing erected on the surface, said flashing having upper and lower substantially planar portions adapted to bear upon and be sealable to the surface and the walls and an intermediate angular connecting portion, said support being adapted to fill a gap in said flashing arising at the intersection of the walls, said support comprising:

a base adapted to overlie the planar surface at the gap;

angled supports extending from said base adapted to bear upon the intermediate flashing portions adjacent to the gap; and

an angled corner extending from said base and configured to fit into and substantially fill the portion of the gap lying between the adjacent intermediate flashing portions, the corner patch suport further having a coating adapted to supply a firm tacking point for said patch, whereby the patch can be sealed thereto so that a substantially smooth transition is made from the flashing portions on one side of the gap to the corresponding flashing portions on the other side of the gap and said patch is firmly supported in a leak-free fashion.

4,603,518
COLLAPSIBLE MOBILE BUILDING
Walter Fennes, Hauptstrasse 115a, A-2372 Giesshübl, Austria
Filed Mar. 28, 1985, Ser. No. 716,893
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1984, 3412048
Int. Cl.[4] E04B *1/343, 7/16;* B60P *3/34*
U.S. Cl. 52—66 **20 Claims**



1. A collapsible building, comprising a first unit having a first side and a second side; a second unit including a base portion and a roof which is separable from said base portion; a joint pivotally connecting said base portion to said first unit for movement about a horizontal axis which is adjacent to and extends along one side of said first unit so that said base portion is movable through a plurality of intermediate positions between an upright first position adjacent to said one side of the first unit and a second position in which one of said units is at least substantially within the confines of the other of said units; and guide means for imparting to said roof a movement along a predetermined path relative to said base portion and in response to movement of said base portion so that the roof is located at a level above the base portion in the first position and above said first unit in the second position of said base portion, the movement of said roof having a component in a direction transversely of said axis.

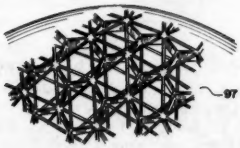
4,603,519
GEODESICALLY REINFORCED HONEYCOMB STRUCTURES
Hyok S. Lew, 7890 Oak St., Arvada, and Michael Stranahan, P.O. Box 15, Woody Creek, both of Colo. 80005
Filed Dec. 17, 1984, Ser. No. 682,675
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—81 **11 Claims**

1. A geodesically reinforced hexagonal honeycomb structure comprising in combination:

(a) a plurality of elongated structural members having a

substantially slender cross section connected together to form a hexagonal network of said hexagonal honeycomb structure; and

(b) a plurality of reinforcing elongated structural members arranged into a triangular network superimposed to said hexagonal network wherein each triangle of said triangular network includes three reinforcing elongated structural members disposed within each hexagonal cell of said hexagonal network, and each corner of each triangular cell is connected to alternate corners of said each hexagonal cell;



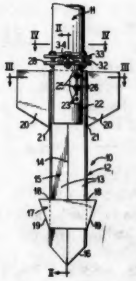
wherein adjacent triangular cells included in said triangular network are connected to each other in a corner-to-corner pattern.

4,603,520

POST MOUNTING ANCHOR BASE

Robert F. Deike, Cheyenne, Wyo., assignor to Construction Robotics, Inc., Chicago, Ill.

Filed Jan. 22, 1985, Ser. No. 693,372
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—98 **11 Claims**



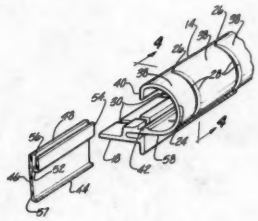
1. An adjustable break away mounting for posts on ground anchors which comprises a leg adapted to be driven upright into the ground to provide a ground anchor, an anchor plate overlying said leg and having depending means overlapping said leg, said leg and said depending means having preformed cooperating fastener receiving holes adapted to register at a plurality of locations, fasteners in selected registering holes fixedly securing the depending means to position the anchor plate at a selected level to control height of the anchor plate relative to the ground, said anchor plate having a central raised dome portion, a post having a base plate on the bottom thereof tiltably supported on said dome portion, shear bolts drawing the post base plate into clamped engagement with the domed portion of the anchor plate, means accommodating rotation of the post base plate relative to the anchor plate whereby the height, tilt, and rotation of the post relative to the leg is selectively controlled and the shear bolts will fracture upon impact of the post to cleanly separate the post from the leg.

4,603,521

SWIMMING POOL COPING AND CLIP

Jack Engelhart, Clio, Mich., assignor to Quality Pool Mfg. Co., Clio, Mich.

Filed Nov. 3, 1983, Ser. No. 548,458
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—102 **15 Claims**



1. A swimming pool coping for use on a swimming pool which includes a pool wall face, said coping comprising at least one somewhat resilient foldable coping piece comprising:

an inward piece portion lying generally inward of a first vertical plane substantially contiguous to said pool wall face; an outward piece portion lying generally outward of said first vertical plane; means forming at least one notch in said inward piece portion; and means forming a corresponding number of relief cuts in said outward piece portion, one each opposite each of said notches; wherein said piece is sufficiently deformable to permit the folding of said piece at each of said at least one notch and said corresponding cut;

wherein said coping piece further comprises a longitudinally extending wall portion attached to said outward piece portion and substantially contiguous to said pool wall face;

wherein said inward piece portion comprises a plurality of semi-cylindrical segments disposed parallel to said longitudinally extending wall portion;

wherein said coping piece further comprises a longitudinally extending flange disposed somewhat coplanar with said longitudinally extending wall portion, joining said segments;

wherein said coping piece comprises means forming an upwardly facing groove therein between said inward and outward piece portions, disposed substantially near said first vertical plane, and wherein said flange extends downwardly towards said groove means; and

wherein said coping comprises a plurality of abuttable coping piece ends, and at least one clip slidably engageable with adjacently disposed coping piece ends so as to simultaneously splice said abutting coping piece ends together and align said upwardly facing groove means and said downwardly extending flanges on said abutting piece ends.

4,603,522

HINGEABLE CONNECTION DEVICE FOR THRU THE SLAB CONNECTIONS IN FOLDABLE BUILDING CONSTRUCTION

Delp W. Johnson, 240 Oakview Dr., San Carlos, Calif. 94070

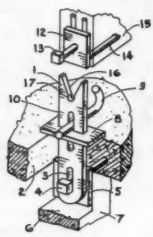
Filed Aug. 12, 1983, Ser. No. 522,574
Int. Cl.[4] E04B *1/344*; E04G *21/14*
U.S. Cl. 52—125.4 **20 Claims**

1. In the method of constructing buildings with folding slabs, a connection device for connecting overlying ceiling slabs to the hinged edge of the underlying wall slabs after said slabs have been cast, said connection comprising,

at least one access slot thru said ceiling slab, minimum width of said slot equal to the thickness of said wall slab, and said

access slot located in said ceiling slab according to the footprint location of said hinge edge of said wall slab in the erected building, and in addition,

an elongated connecting member, said member less in width than said access slot, and thickness of said wall; and said member capable of being installed from above said overlying slab down thru said access hole to engage a pivot means located in edge of said underlying wall slab, and in addition,



a restraining means provided to limit the vertical movement of said elongated member from passing downward all the way thru said access slot, and;

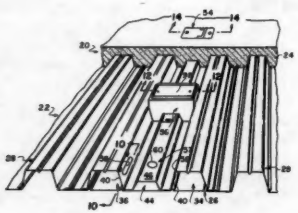
means provided in said elongated device to permit said overlying slab to move upward, and then said elongated member to engage said pivot means, and to elevate said pivot means and permit said wall to rotate to a vertical dependent position, and lowering said ceiling slab causes said wall to come to bear on a supportive surface, and said elongated member to guide said ceiling slab to a precise position bearing on said wall.

4,603,523

UNDERFLOOR ACCESS HOUSING

Raymond E. Albrecht, Sewickley, and Paul L. Haskins, Aliquippa, both of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Jun. 20, 1984, Ser. No. 622,481
Int. Cl.[4] E04B *5/48*
U.S. Cl. 52—221 **12 Claims**



1. An access housing in combination with a metal cellular flooring unit, said flooring unit providing generally parallel enclosed cells separated by troughs, each of said cells presenting a crest and webs depending therefrom and connected to valleys forming part of said troughs, said housing spanning between the crests of two of said cells and comprising:

a top wall having an access opening:

distinct perimeter walls including end walls depending toward the webs of said two of said cells and side walls depending toward the flooring unit, said side walls extending into the region between said two of said cells and having lower perimeter edges contoured to match the contour of that portion of said flooring unit in the region between the crest of two of said cells;

the webs of said two of said cells having generally vertically presented slots;

flexible connecting means presented by said end walls, engaging said slots and connecting said housing to said flooring unit; and

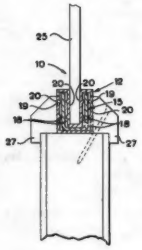
defectable means provided by each of said side walls, engaging a surface of said flooring unit intermediate of said two of said cells, being deflected, and urging said housing upwardly relative to said flooring unit to maintain said connecting means engaged in said slots.

4,603,524

FIRE RESISTANT GLAZING SYSTEM

Robert Mann, Exeter, England, assignor to Lorient Polyproducts Ltd., Exeter, England

Filed Jul. 25, 1984, Ser. No. 634,416
Claims priority, application United Kingdom, Jul. 28, 1983, 8320324
Int. Cl.[4] E06B *1/04*; E04C *2/54*; E04F *19/02*
U.S. Cl. 52—232 **9 Claims**



1. A glazing strip for mounting a pane, the strip including an extrusion of U-shape cross-section to define a channel for receiving a marginal edge portion of the pane to be mounted, the extrusion being hollow to define a U-shaped void in which is housed intumescent material, the intumescent material being in the form of a U-shaped strip which partially fills the void to define a cavity between the intumescent strip and the internal side walls of the extrusion.

4,603,525

STORAGE VESSEL

Stuart D. Byers, and John F. Clark, both of Mississauga, Canada, assignors to Crophandling Systems Limited, Mississauga, Canada

Filed Jul. 25, 1983, Ser. No. 516,987
Claims priority, application Canada, Mar. 22, 1983, 424161
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—245 **1 Claim**

1. A cylindrical storage vessel for water and other fluids which create high hydrostatic pressures, comprising:

a vertical cylindrical wall having a thickness formed of a plurality of flangeless plates, each of substantially the same height, and each being substantially rectangular and having series of holes in margins which are contiguous with its respective upper margin, lower margin right-hand and left-hand edge margins edges; and a horizontal foundation;

each of said plates having a lower portion and an upper portion, and an inner surface and an outer surface;

said storage vessel being assembled by fastening said plates together using headed fasteners passing through holes in at least two overlapping plates, in each instance;

where said vessel comprises a plurality of rows of plates, where each successive higher row of plates is placed so that at least a lower outer surface portion of each row

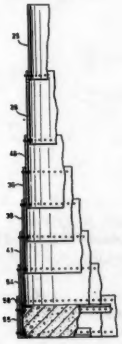
contacts a higher inner surface portion of a next successive lower row of plates;

said vessel being so constructed that in its lower portion the wall thickness thereof comprises at least two thicknesses of said plates, where said plates are placed in the following manner:

a first row of plates is a lowermost row in said a lower portion of said vessel, there are a plurality of intermediate rows of plates in said lower portion of said vessel, and there is an uppermost row of plates in said lower portion of said vessel;

each of said plates in each intermediate row of plates is placed so that its upper inner surface is in surface-to-surface contact with at least the a lower half of the a lower outer surface of a next successive higher row of plates, and its lower outer surface is in surface-to-surface contact with at least an upper half and upper inner a next successive lower row of plates;

the left-hand and right-hand edges of each of said plates in each row of plates are marginally staggered with respect to the left-hand and right-hand edges of each of the plates in the next successive higher and lower rows of plates, respectively; so that for each row of plates the upper portion of the right-hand edge of each plate thereof is in edge-to-edge contact with the lower portion of the left-hand edge of a plate in the next successive higher row of plates;



and in said lower portion of said vessel, from the upper margin of said lowermost row of plates to the lower margin of said uppermost row of plates in said lower portion of said vessel, the successive rows of plates are so placed that there are three thicknesses of plates at each the upper margin of a first lower row of plates; comprising said upper margin, an intermediate portion of the first next successive higher row of plates, and the lower margin of the second next successive higher row of plates;

where said fasteners pass through said series of holes in said upper margin of the first lower row of plates, and thence through a series of holes in the intermediate portion of the first next successive higher row of plates, and thence through said series of holes in said lower margin of said second next successive higher row of plates; and also through the series of holes at the right-hand and left-hand margins of said plates, and such additional holes near the right-hand and left-hand margins in the upper and lower portions thereof as are necessary to accommodate said fasteners passing through said three thicknesses of plates at said margins;

and where the wall of said vessel in its upper portion above said lower portion comprises only a single thickness of plates except where the marginal edges of the plates in any one row marginally overlap the edges of the next contiguous plates in that same row, and where the upper margins of the plates in any one row marginally overlap the bottom margins of the plates in the next successive higher row of plates.

4,603,526

GROUND SECURING DEVICE

Jean-Jacques Bollmann, Löwenstrasse 29, CH-8021 Zürich 1, Switzerland

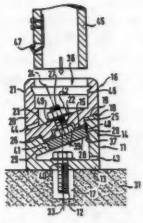
PCT No. PCT/CH84/00193, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985, PCT Pub. No. WO85/03731, PCT Pub. Date Aug. 29, 1985

PCT Filed Dec. 10, 1984, Ser. No. 793,072

Claims priority, application Switzerland, Feb. 16, 1984, 746/84; European Pat. Off., Oct. 10, 1984, 84112151.0

Int. Cl.⁴ E02D *27/42*

U.S. Cl. 52—296 **9 Claims**



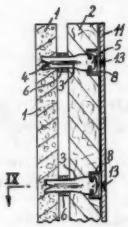
1. A base support for fastening a pole standing off from a foundation, provided with a base member or an anchor body having below a base wall being attachable in relation to a foundation by a central anchor bolt or a connecting bolt and rotatable around a first rotation axis which is substantially perpendicular to the foundation, above it an all around running side wall and on the top an access opening surrounded by a ring-shaped bearing surface proceeding transversally to the base wall and showing such a dimension that through the access opening the anchor bolt is insertable and accessible, and with a pole supporting member presenting at the top a connecting area for the pole, below an all around running side wall and at its bottom a mounting wall having a ring-shaped supporting surface which is complementary to the bearing surface, whereby the mounting wall is provided with a central boring for permitting a rotation around a second rotation axis proceeding perpendicular to the bearing or supporting surface, whereby the central boring serves for passing through a stud bolt which has a perpendicular position to the bearing or supporting surface and secures the mounting wall to the base wall, thus establishing a firm axial clamp joint between the bearing and the supporting surface, the stud bolt being axially braced against the mounting wall and accessible through an access opening in the upper region of the pole supporting member, characterized in that radially outside the access opening **(15)**, between the base wall **(13)** and the mounting wall **(23)**, an axial, dynamically balanced insert connection **(25, 26)**, is provided being concentric to a second rotation axis **(24)**, and that the central stud bolt **(27)** is fastened at the base member in the peripheral area of the access opening, still radially inside the insert connection **(25, 26)**, however, by a screw joint **(37, 37', 37'')**, being accessible and operatable from above.

4,603,527

PREFABRICATED WALL FOR THE CONSTRUCTION OF HOUSES AND BUILDINGS

Antoine Vercelletto, Mamers, France, assignor to Enterprise Vercelletto, Mamers, France

Filed Jun. 12, 1984, Ser. No. 620,082
Claims priority, application France, Jun. 21, 1983, 83 10232
Int. Cl.[4] E04B *2/02*
U.S. Cl. 52—410 7 Claims



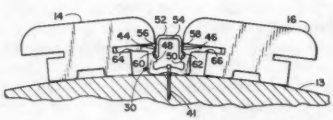
1. A prefabricated wall constituted by two panels respectively of concrete and of insulating material, said panels being joined together by means of a series of coupling elements so as to leave an air gap between said panels, each coupling element being carried at one end by the concrete panel, engaged at the other end through the insulating panel and joined on the other side of said insulating panel to a retaining member placed against the corresponding face of said panel, wherein the coupling elements consist of anchors each having a head remote from the end which is embedded in the concrete panel, said head being provided with notches adapted to permit resilient attachment of a sectional member having a generally U-shaped cross-section and constituting a retaining member for a series of coupling anchors in aligned relation, said retaining member being placed astride the corresponding heads of the coupling anchors, said anchors being disposed in planes at right angles to the axis of the corresponding retaining member whilst the notches are formed in the edges of the anchor heads for receiving fastening flanges provided on the side portions of said retaining member, and spacers carried by the coupling elements and in contact both with the concrete panel and with the insulating panel thereby to maintain said air gap.

4,603,528

PANEL INSTALLATION

Helmut Sigerist, Fort Langley, Canada, assignor to Venturetech Enterprises, Inc., Vancouver, Canada

Filed Jul. 2, 1985, Ser. No. 751,066
Int. Cl.[4] E04C *1/34*
U.S. Cl. 52—464 6 Claims



1. A panel installation on a supporting surface which comprises:

multiple panel pieces having front and back sides one piece beside an adjacent piece and their said front sides facing outwardly, the pieces having essentially parallel opposed side margins, said pieces having slots extending along each of their opposite margins indented laterally inwardly from the margins and said pieces having a shoulder defined at each side margin located between the slot which extends along the margin and the front side of the piece, the shoulders of adjacent pieces being laterally spaced from each other,

an elongate anchoring element of generally U-shaped cross section securing adjacent pieces through said margins to said surface, said anchoring element having a base web which is adjacent said surface and opposed upstanding flange portions joined to said base web along opposite margins of the base web to define a receptor channel which faces outwardly from said surface, said anchoring element further having wing flanges joined to said upstanding flange portions forming the top of the element and said wing flanges being disposed below the shoulders of adjacent pieces, the wing flanges extending laterally outwardly and fitting within the slots of adjacent panel pieces, and

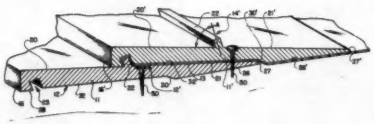
an elongate cover strip having a top, a bottom, and opposed sides mounted with the sides thereof frictionally seated within the receptor channel defined by said anchoring element and the top thereof filling the space between shoulders of adjacent pieces.

4,603,529

ROOFING SYSTEM

Duane Cronenwett, and Robert W. Gottfried, both of 911 N. Railroad Ave., West Palm Beach, Fla. 33401

Filed May 1, 1984, Ser. No. 605,848
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—536 14 Claims



10. In a roofing system, wherein a plurality of roof members are arranged to nest with respect to each other, the improvement which comprises a plurality of overlapping roof members constituting at least an upper roof member and a lower roof member, each of the roof members having a pair of generally wedge-shaped sections including a first section and a second section joined by an intermediate section, wherein the first section of the lower roof member is received substantially beneath the second section of the upper roof member, the intermediate section of the lower roof member having an upwardly-projecting flange formed thereon, and the second section of the upper roof member including a generally thickened forward portion having a bottom surface formed with a groove therein, wherein the flange on the lower roof member is received within the groove on the upper roof member with a relatively snug fit therebetween.

4,603,530

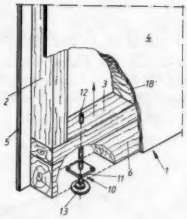
WALL ELEMENT

Karl Glockenstein, Mautner Markhofgasse 94, 1110 Wien, Austria

Filed Apr. 1, 1982, Ser. No. 364,252
Claims priority, application Austria, Apr. 7, 1981, 1610/81; Apr. 7, 1981, 1611/81; Apr. 7, 1981, 1612/81
Int. Cl.[4] E04B *5/58*
U.S. Cl. 52—741 3 Claims

1. A method of installing a prefabricated wall element, in particular for interior walls of buildings, which comprises providing a frame structure and cover plates having sufficient inherent thickness and being attached over both sides of the frame structure with projecting free edges, said frame structure including at least two frame parts which are slidable one into another, said cover plates being fixed to only one of said frame parts in prefabricated manner, and at least one other frame part which is not fixed to the cover plates and which is slidably arranged in relation to said free edges formed by both

cover plates according to a required maximum cutting distance, cutting the free edges of the cover plates projecting

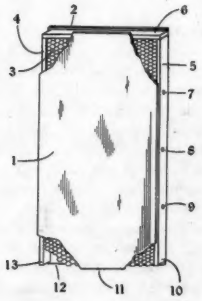


beyond said frame structure to conform to dimensions of a room in which said wall element is being installed, and thereafter securing said other frame part to said cover plates.

4,603,531
STRUCTURAL PANELS

Henry R. Nash, 171 Walnut Ave., Arcadia, Calif. 91006

PCT No. PCT/US83/00403, § 371 Date Nov. 19, 1984, § 102(e) Date Nov. 19, 1984, PCT Pub. No. WO84/03728, PCT Pub. Date Sep. 27, 1984
PCT Filed Nov. 19, 1983, Ser. No. 675,925
Int. Cl.[4] E04C *2/34*
U.S. Cl. 52—806 **4 Claims**



1. A structural panel for use in the building industry utilizing foundation plates comprising:

(a) two vertical support members having upper and lower ends,

(b) an upper horizontal member secured to said two vertical support members with glue,

(c) a covering sheet on either side of said vertical support members and said upper horizontal member, attached to said vertical support members and said horizontal member with glue said covering sheet on either side extend downward beyond the lower ends of the vertical support members such a distance that when the lower ends of the vertical support members rest upon the foundation plate the lower ends of the covering sheets are approximately one centimeter (⅜ inch) above the foundation, and

(d) a honeycomb core which is glued to both of said covering sheets.

3. A method of constructing structural panels for use in the building industry utilizing foundation plates, which comprises the steps of:

(a) gluing two vertical support members to an upper horizontal member forming a structure having a first and second side with an upper and lower end;

(b) gluing a first covering sheet to the first side of the two vertical support members and the horizontal member;

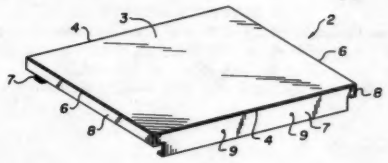
(c) gluing a honeycomb core to the first covering sheet;

(d) gluing a second covering sheet to the second side of the two vertical support members and the horizontal member and to the honeycomb core said first and second covering sheets are glued to said two vertical supports such that their lower surfaces extend downward beyond the lower ends of the vertical support members such a distance that when the lower ends of the vertical support members rest upon the foundation plate the lower ends of the covering sheets are approximately one centimeter (⅜ inch) above the foundation.

4,603,532
MODULAR BUILDING CONSTRUCTION

John Watson, North Vancouver, Canada, assignor to Structural Design Services, North Vancouver, Canada

Filed Nov. 6, 1985, Ser. No. 795,674
Int. Cl.[4] E04C *2/38;* E04B *5/02*
U.S. Cl. 52—830 **3 Claims**



1. A metallic floor panel having top, sides and ends with the sides being longer than or equal in length to the ends, the panel comprising:

a flat upper surface;

end channels attached to the upper surface at each end;

side channels attached to the upper surface at each side;

the side channels extending further from the upper surface than the end channels;

major ribs, generally parallel to the ends of the panel and extending the width of the panel;

minor ribs arranged between the major ribs and between the major ribs and the end channels;

the end channels having lower surfaces generally parallel to the top surface to enable mounting of the panel to a main beam of a building.

4,603,533
APPARATUS FOR MANUFACTURING DISCRETE LAYERED UNITS FROM A WEB

Carroll Musick, 97 Union St., Erwin, Tenn. 37650

Continuation-in-part of Ser. No. 248,486, Mar. 27, 1981, Pat. No. 4,479,295. This application Jul. 13, 1983, Ser. No. 513,175
Int. Cl.[4] B65B *13/18*
U.S. Cl. 53—117 **24 Claims**

1. An apparatus for folding a web of material into a serpentine configuration comprising:

a chute for receiving the web of material;

feed means for feeding the web in an initial feed path toward the chute at a selected feed rate;

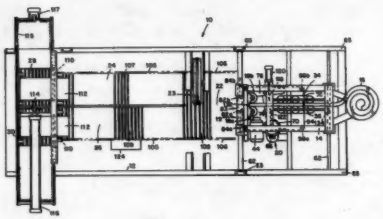
means for reciprocating said feed means at a selected reciprocation rate in a transverse direction generally perpendicular to the initial feed path;

surface defining means disposed between said feed means and said chute;

an aperture defined in said surface defining means for admittng the web therethrough and into said chute;

means for moving said aperture at the selected reciprocation rate in a reciprocal motion to follow the motion of said

feed means so that said feed means, said surface defining means and said aperture operate cooperatively to fold the



web in the chute and said surface defining means urges the folded web into and through the chute.

4,603,534

APPARATUS FOR WRAPPING ARTICLES, ESPECIALLY CIGARETTE GROUPS

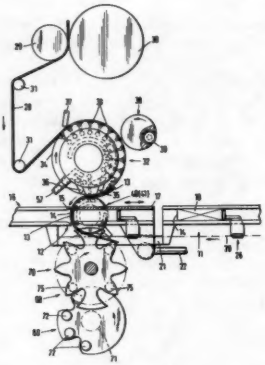
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Oct. 30, 1984, Ser. No. 666,516

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340408

Int. Cl.[4] B65B *19/24*

U.S. Cl. 53—231 **11 Claims**



1. An apparatus for wrapping articles conveyed in a first transport direction in a blank of material which is severed from a sheet of said material comprising:

first endless conveyor means adapted to hold said sheet material by suction and to cut said sheet material into desired blank portions;

second endless conveyor means adapted to transfer said cut sheet material from said first endless conveyor means and to retain said blank portion on the surface thereof in at least two lateral edge regions and to rotate said blank to a position which is transverse to the direction of transport of the article; and

means for pulling said blank from said second endless conveyor means and wrapping said blank around the article in a U-shaped manner, the improvement wherein:

said first endless conveyor means is driven to rotate continuously and said second endless conveyor means is driven intermittently between a rotational phase and a standstill phase, whereby during said standstill phase said means for pulling the blank operates to remove the blank from said second endless conveyor.

4,603,535

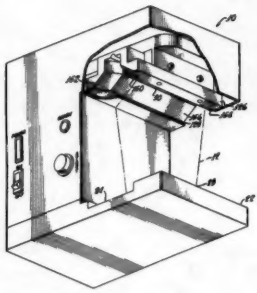
PORTABLE SEALING DEVICE

Stephen K. Schultheis, Laguna Hills, Calif., assignor to Container Development Company, Costa Mesa, Calif.

Filed May 28, 1985, Ser. No. 738,478

Int. Cl.[4] B65B *7/16*

U.S. Cl. 53—373 **23 Claims**



1. Apparatus for sealing plastic coated paperboard cartons comprising:

a frame;

a fixed jaw mounted to said frame;

a movable jaw;

means for heating said fixed and movable jaws;

means for mounting said movable jaw to said frame for enabling controlled movement of said movable jaw from a spaced apart relationship with said fixed jaw to a position for providing sufficient pressure to sealable portions of a carton disposed between the fixed and movable heated jaws to cause sealing of said sealable portions;

means for moving said movable jaw; and

temperature regulation means connected in an operative relationship with the heating means for enabling said carton sealable portions to remain adjacent to said fixed jaw after sealing thereof without causing unsealing of said carton sealable portions.

4,603,536

APPARATUS FOR FORMING A WEB OF FILM INTO A TUBULAR SHAPE IN A FORM, FILL AND SEAL PACKAGING MACHINE

Roland de la Poype, Paris, France, assignor to Societe D'Etude et D'Application Industrielle de Brevets, Villejuif, France and Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 1, 1985, Ser. No. 697,532

Int. Cl.[4] B65B *9/08, 61/18*

U.S. Cl. 53—410 **12 Claims**

11. A process for creating a flexible container comprising the steps of:

feeding a web of film into a form, fill and seal packaging machine;

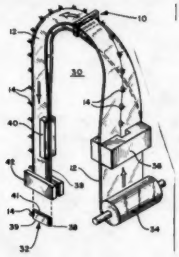
attaching fitments to the web of film while the film in a substantially flat condition;

passing the web of film with attached fitments through a channel with a cut out;

sealing an end of the web of film;

sealing a side of the web of film;

filling the web of film with a product;
sealing a second side of the web of film;

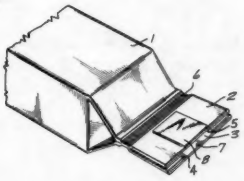


creating an oblique weld between a fitment and a side weld; and
severing the web of film into an individual package.

4,603,537
METHOD FOR MAKING A BAG WITH A BAG MOUTH CLOSURE

Vincent C. Pace, Bellevue, Wash., assignor to Formost Packaging Machines, Inc., Woodinville, Wash.

Division of Ser. No. 440,898, Nov. 12, 1982. This application Mar. 25, 1985, Ser. No. 715,427
Int. Cl.[4] B65B *9/06, 61/00*
U.S. Cl. 53—415 **3 Claims**

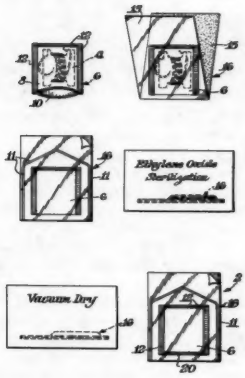


1. The process of making reclosable bags which comprises moving bag-making sheet material lengthwise, adhesively applying to such bag-making sheet material stiffening patches at predetermined intervals lengthwise of the direction of movement of the bag-making sheet material, forming the bag-making sheet material into a tube, inserting into the tube between the stiffening patches product to be packaged, sealing the tube at both sides of each patch to form spaced seals with each seal located adjacent to a stiffening patch and between such patch and adjacent product received in the tube, severing the tube along a cutting line between a seal and an adjacent stiffening patch carried by the bag material to form two adjacent ends of two adjacent bags with the seal adjacent to such cutting line entirely on the adjacent end of a first bag and the adjacent stiffening patch carried entirely by the adjacent end of a second bag, thereby enabling subsequent parting of the parts of the seal of the second bag between the stiffening patch carried thereby and the product in such second bag and thereby opening the second bag to afford access to the product therein through the bag end carrying the stiffening patch and enabling manual bending of the stiffening patch carried by such bag end and the sheet material to which such stiffening patch is applied about a straight line parallel to the ends of the second bag for reclosing the end of the second bag carrying the stiffening patch.

4,603,538
METHOD OF PREPARING A DOUBLE STERILE PACKAGE

William H. Shave, Amityville, N.Y., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Nov. 15, 1984, Ser. No. 671,727
Int. Cl.[4] B65B *31/02, 55/10, 55/18*
U.S. Cl. 53—425 **4 Claims**



1. A method of preparing a sterile double package including (1) a generally rectangular sealed inner package containing a sterile surgical article and comprising two opposed sealable layers of material sealed adjacent their peripheries and (2) a generally rectangular sealed outer package totally surrounding said inner package and comprising two opposed sealable layers of material sealed adjacent their peripheries with at least one of said opposed layers being vapor permeable, said inner package not being constrained from movement within said outer package, comprising the steps of

(a) inserting a surgical article into said inner package, said inner package being sealed on three sides and open on the fourth side;

(b) inserting said inner package between said opposed layers of said outer package, with no more than three sides of said layers of the outer package being sealed, and then sealing the remaining sides of the outer package to totally enclose the inner package to form a double package;

(c) sterilizing the contents of the outer package by perfusion of a sterilizing gas through said vapor permeable layer thereof;

(d) removing gas vapors through vacuum, and,

(e) sealing the fourth side of the inner package adjacent the periphery thereof through the outer package,

with the conditions of the sealing operation of said step (e) and the materials of said opposed layers of said inner and outer packages being such that neither layer of said outer package is sealed to the adjacent layer of said inner package and said opposed layers of said outer package are not further sealed together during the sealing operation of said step (e).

4,603,539

METHOD AND APPARATUS FOR AUTOMATICALLY FRAMING SLIDES IN A FRAMING APPARATUS

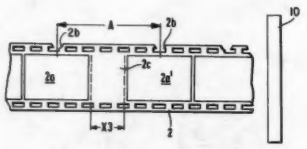
Herbert Müssig, Murnau, and Claus Pohl, Eschenlohe, both of Fed. Rep. of Germany, assignors to Geimuplast Peter Mundt GmbH & Co. KG., Farchant, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,449

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236845

Int. Cl.[4] B65B *63/00*

U.S. Cl. 53—435 **10 Claims**



1. A method for automatically framing slides in a framing apparatus in which the slides are subjected at a framing station at the leading end of the slide film passing through the filming apparatus to a framing cycle which comprises individual severing of slides together with introduction in a ready-positioned frame and subsequent transmission of the framed slide to a storage box, wherein the position of the individual slides on the film is detected by an automatic film scanning apparatus of a control device which controls the relationship of the film feed to the severing apparatus of the framing station in the sense of arranging the lines of cut in a correct relationship to the images of the individual slides, said method comprising:

providing a slide film having a plurality of individual slides with consecutive individual slides intended to be in spaced relationship at a predetermined spacing defined by spacer strips therebetween having an intended predetermined width along the slide film, and with at least one marginal notch for each slide and intended to have a predetermined reference position with respect to an associated slide to enable it to be used as a frame marking detectable by a film scanning means,

measuring the passing slide film for the spacing between successive marginal notches,

comparing the measured spacing between notches with a reference notch spacing value corresponding to a normal notch spacing between successive notches,

sensing whether a spacer strip is present for each notch in a predetermined spacing tolerance range measured from the predetermined reference position, and

cutting the film between successive slides only if the measured marginal notch spacing corresponds with the given notch spacing reference value resulting from correct operation of the notching apparatus and correct feeding of the slide film in the camera, and if a spacer strip has been sensed and has a width that corresponds with the predetermined spacing tolerance range between consecutive slides.

4,603,540

APPARATUS FOR MAKING PACKAGING BAGS

Georg Kopp, Uhwiesen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jun. 20, 1984, Ser. No. 622,743

Claims priority, application Switzerland, Jun. 20, 1983, 3366/83

Int. Cl.[4] B65B *9/02*

U.S. Cl. 53—546 **20 Claims**

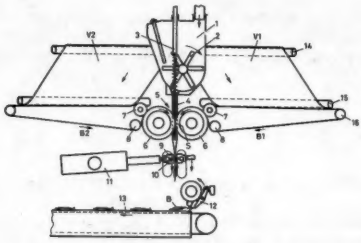
1. In an apparatus for making sealed packages from two superposed, sealable flexible wrapper sheets, comprising

(a) first and second support rings each having a peripheral guiding surface of outwardly convex circumferential course; said support rings being radially adjacent for guiding respective first and second wrapper sheets towards one another into a superpositioned alinged relationship;

(b) means defining a plurality of radial grooves on the guiding surface of each said support ring;

(c) first and second sealing discs supported coaxially with said first and second support rings, respectively, at opposite sides thereof; each sealing disc having a peripheral working surface; on each side of the first and second support rings one of said first sealing discs and one of said second sealing discs forming a sealing disc pair for longitudinally pressing and sealing together said first and second wrapper sheets along opposite edge zones thereof, whereby opposite longitudinal seams are formed in the superposed running sheets parallel to a running direction thereof;

(d) means for rotatably supporting said sealing discs;



(e) first and second sheet deflecting rollers situated radially adjacent and upstream of the respective said first and second support rings as viewed in said running direction for defining loop-around paths for said first and second wrapper sheets on the respective said first and second support rings;

(f) first and second shaping means carried on the respective first and second support rings for shaping said first and second wrapper sheets immediately upstream of said sealing discs;

(g) transverse sealing means situated downstream of said sealing discs for sequentially providing transverse seams on said sheets; and

(h) cutting means for severing the sealed sheets into predetermined lengths whereby packages of defined dimensions are obtained.

4,603,541

PACKAGING MACHINE

Emmerich Medwed, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller KG, Fed. Rep. of Germany

PCT No. PCT/EP85/00045, § 371 Date Sep. 26, 1985, § 102(e) Date Sep. 26, 1985, PCT Pub. No. WO85/03488, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 7, 1985, Ser. No. 783,228

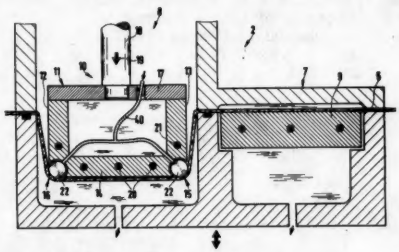
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1984, 3404619

Int. Cl.[4] B65B *47/04;* **B29C** *51/08, 51/30*

U.S. Cl. 53—561 **6 Claims**

1. Packaging machine comprising a molding station for molding a container from a material web by means of a molding die provided with at least one side wall, a bottom area and an edge area therebetween, rotatably supported roll or roller bodies in the edge area and a support securing the roll or roller body against falling out and having a mounting, wherein the roll or roller body is disposed in an emerged or retracted manner such that part of the surface thereof forms part of the edge area, characterized in that the support **(24)** comprises a friction bearing **(31)** having a bearing seat **(38)** adapted to the

shape of the roll or roller body (22) and that a channel (39) having one end opening into the bearing seat (38) and the other



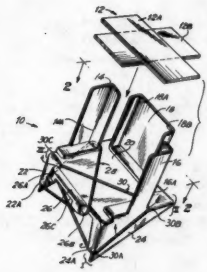
end connectable with a conduit (40) for supplying gaseous medium is provided within the support (24).

4,603,542

BOOKLET CRISS-CROSS STACKING FIXTURE

Eli Reiter, Dix Hills, and Joseph R. Robson, Smithtown, both of N.Y., assignors to General Aero Products Corp., Copiague, N.Y.

Filed Nov. 5, 1984, Ser. No. 668,204
Int. Cl.[4] B65B *27/08;* B65H *33/08*
U.S. Cl. 53—585 6 Claims



1. A fixture for facilitating the development of a criss-cross stack of interleaved articles of a predetermined configuration, comprising:

a cradle having a planar upper surface oriented at an acute angle to the horizontal and a forward supporting wall between said planar upper surface and the horizontal,

a pair of opposed side posts substantially perpendicular to said upper surface for supporting one group of said articles oriented in a first direction,

a rear wall member for supporting a second group of said articles oriented in a second direction, said articles comprising substantially rectangular members corresponding to said predetermined configuration and having opposite side and end edges, each of said members having a longitudinal axis parallel to said side edges, said first direction of said one group of said articles comprising even alternate ones of said members having said longitudinal axis thereof aligned, said second direction of said second group of said articles comprising odd alternate ones of said members having said longitudinal axis thereof aligned and also perpendicular to said longitudinal axis of said even alternate ones of said members, each of said pair of opposed side posts comprising a side wall portion and a back wall portion substantially perpendicular to said side wall portion, thereby defining a corner edge portion therebetween, said side wall portions being spaced apart to accommodate said end edges of said odd alternate ones of said members therebetween along said corresponding longitudinal axis thereof, and said rear wall portions being aligned with each other to define a discontinuous supporting surface for one of said side edges of said members,

projecting means on said forward wall defining multiple holding positions thereon, said projecting means comprising a flange portion attached to said forward supporting wall, said flange portion having a first corner edge and an opposite second corner edge, said forward wall having first and second corner legs extending between said planar upper surface and said horizontal and thereby defining said acute angle, and

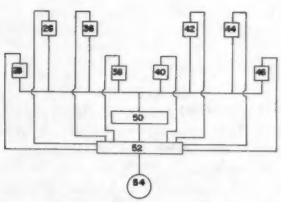
retaining means initially occupying inactive positions on said upper surface and around said projecting means during the loading into said cradle of said articles, and for subsequently occupying stabilizing positions around said stack during removal of said articles from said cradle, each of said forward wall corner legs including a discontinuous surface to define a corner receiving area for said retaining means.

4,603,543

COTTON HARVESTER HARVESTING ROTOR SPEED MONITOR

Charles R. Cornell, Naperville, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 1, 1984, Ser. No. 636,518
The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.
Int. Cl.[4] A01O *46/08*
U.S. Cl. 56—10.2 5 Claims



1. A cotton harvester with a plurality of harvesting rotors having a rotor speed monitor system comprising:

rotor revolutional speed counting means;

averaging means to determine the average rotational speed of the combined rotors;

alarm means activated by a predetermined differential rotational speed of rotor from the average rotational speed of said combined rotors; and

alarm deactivating means deactivating the alarm when the average rotor rotational speed of said rotors is below a predetermined level.

4,603,544

LITTER RETRIEVING MACHINE

Wesley D. Hayhurst, Tulia, Tex., assignor to Proficient Systems, Inc., Dallas, Tex.

Filed Jan. 28, 1985, Ser. No. 695,799
Int. Cl.[4] A01D *46/00*
U.S. Cl. 56—328 R 2 Claims

1. A litter retrieving machine comprising:

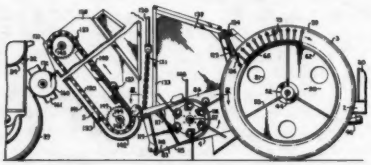
(a) a framework for movement over a ground surface;

(b) a ground engageable rotating drum mounted in said framework and having opposite end rings secured together by a plurality of channel members extending between said rings and forming a drum circumference;

(c) said channel members being generally C-shaped with opposed, inwardly extending flanges defining a slot therebetween and with a connecting web;

(d) said connecting web being crowned toward said slot and having a radius of curvature greater than the radius of curvature of said drum;

(e) a plurality of fingers mounted to said drum for engagement and retrieval of litter and having bases slidably received in said channel members and finger shafts projecting outwardly through said slots, said bases being trapped



in said channel members and urged toward said flanges by said web;

(f) stripper means for removing said litter from between said fingers;

(g) conveyor means for transporting said litter from said stripper means; and

(h) a hopper mounted in said framework and communicating with said conveyor means.

4,603,545

YARN TWISTING AND WINDING APPARATUS

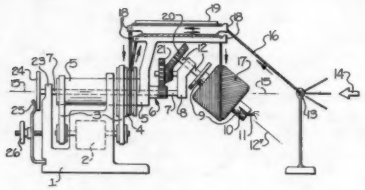
Georg Siebert, Hückeswagen, Fed. Rep. of Germany, assignor to Artec Design GmbH, Fed. Rep. of Germany

Filed Aug. 14, 1985, Ser. No. 765,707

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430046; Jul. 20, 1985, 3525996

Int. Cl.[4] B65H *54/66*; D01H *7/50*

U.S. Cl. 57—68 **22 Claims**



1. A yarn twisting and winding apparatus adapted to produce a yarn ball, and which includes yarn takeup means comprising a yarn support spindle **(12)** which defines a spindle axis **(12')**, a yarn twisting flyer **(19)** mounted for rotation about said yarn support spindle and so as to define a central axis **(15)**, and flyer drive means **(2,3,5)** for rotating said flyer about said central axis, characterized in that said yarn takeup means includes means **(7,8)** mounting said yarn support spindle such that said spindle axis is angularly disposed with respect to said central axis and such that said yarn support spindle is rotatable about both said central axis and said spindle axis, and drive transmission means **(20,21,29)** operatively connected to said flyer drive means for concurrently rotating said yarn support spindle about said central axis and said spindle axis.

4,603,546

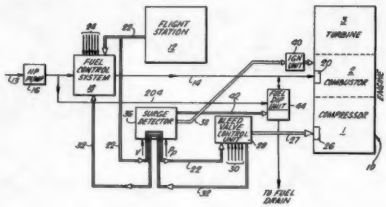
CONTROL SYSTEMS FOR GAS TURBINE AEROENGINES

Brian J. Collins, Box 63, Mickleover, England, assignor to Rolls-Royce Limited, London, England

Filed Jul. 16, 1985, Ser. No. 755,433

Int. Cl.[4] F02C *9/18, 9/52*

U.S. Cl. 60—39.02 **12 Claims**



1. A method for automatically controlling compressor surge conditions in a gas turbine aeroengine, comprising in automatic sequence the steps of:

(a) continuously monitoring the valve of the pressure at a predetermined location in the compressor;

(b) detecting the onset of compressor surge conditions by detecting occasions when the ratio of the first derivative with respect to time of the monitored pressure to the monitored pressure itself is less than a predetermined reference value; and

(c) initiating action to control the surge whenever the onset of surge conditions is detected.

4,603,547

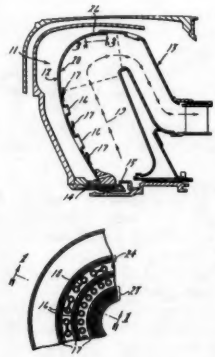
CATALYTIC RELIGHT COATING FOR GAS TURBINE COMBUSTION CHAMBER AND METHOD OF APPLICATION

William C. Pfefferle, Middletown, N.J., and Michael J. Bak, Walled Lake, Mich., assignors to Williams Research Corporation, Walled Lake, Mich.

Filed Oct. 10, 1980, Ser. No. 195,787

Int. Cl.[4] F02C *7/262*

U.S. Cl. 60—39.02 **24 Claims**



1. A gas turbine combustion chamber having a wall with an inner surface exposed to the combustion chamber flame, and a coating of a catalytic material on said surface over a large enough area thereof to cause reignition of the fuel-air mixture after flame-out.

13. A method of facilitating reignition after flame-out in a

gas turbine combustion chamber, comprising the step of applying a catalytic coating to the inner surface of said combustion chamber over a sufficient area to facilitate reignition of the fuel-air mixture in the event of a flame-out.

4,603,548

METHOD OF SUPPLYING FUEL INTO GAS TURBINE COMBUSTOR

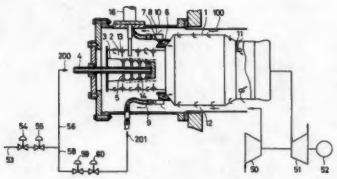
Yoji Ishibashi; Isao Sato, both of Hitachi; Fumio Kato, Toukai; Takashi Ohmori, and Noriyuki Hayashi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,658

Claims priority, application Japan, Sep. 8, 1983, 58-164164

Int. Cl.[4] F02C *9/00*

U.S. Cl. 60—39.06 **9 Claims**



1. A method for supplying a fuel for a gas turbine combustor of the type which introduces high pressure air and a fuel thereinto and combusts the fuel and air to generate a high temperature turbine operating gas, and which includes a first stage combustion chamber having a first stage fuel supply means and an air supply means each disposed upstream of said combustor, and a second stage combustion chamber having a second stage fuel supply means and an air supply means each disposed downstream of said first stage fuel supply means, the method comprising the steps of supplying the fuel only from said first stage fuel supply means to only operate said first stage combustion chamber from the start of operation of said gas turbine until the gas turbine combustor is in a low output range; and supplying in a step change such that a fuel flow rate changes more rapidly than in normal load control the fuel from said second stage fuel supply means to be at a predetermined flow rate and at the same time, decreasing in the step change substantially the same quantity of the fuel, that is being supplied from said first fuel supply means, when the second stage fuel is to be supplied and wherein the second stage fuel to be supplied in a step change into the second combustion chamber is excessively charged above a predetermined value for a short period of time and, at the same time, the first stage fuel to be decreased in the step change is excessively reduced below a predetermined value.

4,603,549

EXPLOSION TYPE ROTARY TURBINE ENGINE

Hans G. Albrecht, Oberdorfstr. 5, D-5441 Hirten, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,839

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406187; Feb. 2, 1985, 3503563

Int. Cl.[4] F02C *5/12*

U.S. Cl. 60—39.161 **12 Claims**

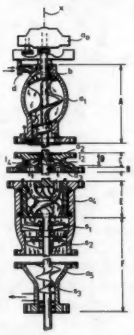
1. A turbine engine comprising:

a housing extending along an axis and having relative to an axial throughput direction an upstream housing section forming a supercharging chamber, a middle housing section forming a plurality of angularly spaced combustion chambers having radially inwardly open intake sides, and a downstream housing section, the housing having at the upstream section an intake and at the downstream section an outlet;

a shaft extending along the axis through the sections of the housing and supported in the housing for rotation in a predetermined rotational sense about the axis, the shaft forming a passage having an upstream end opening axially into the supercharging chamber downstream of the intake and a downstream end opening radially on the shaft level with the intake sides of the combustion chambers, the shaft fitting the housing at the combustion chambers so as to block the intake sides of all but the intake side angulary aligned with the downstream end of the passage;

means including a rotary-action fan rotationally fixed to the shaft in the supercharging chamber for advancing and compressing air from the intake in the direction on rotation of the shaft, whereby the compressed air can pass through the shaft passage into whichever chamber is angularly aligned with its downstream end;

means for introducing fuel and heat into the combustion chambers for mixing with air entering these chambers via the passage from the supercharging chamber and for exploding this mixture and producing high-pressure gases;



a valve plate fixed in the housing and formed with axially throughgoing ports aligned with and opening axially into the respective combustion chambers;

a rotor piston fixed on the shaft having an upstream face and at least one axially throughgoing tube having

an upstream end open at the upstream face,

a downstream end opening downstream into the downstream housing section and trailing the upstream end angularly in the rotational sense, and

a nonaxial intermediate connecting portion extending between the upstream and downstream tube ends, the upstream end being brought into axial fluid-communication alignment with each valve port on each rotation of the shaft about the axis, whereby the high-pressure gases escape from the combustion chambers through the ports and pass into the tube of the piston to convert axial movement of the gases into rotary movement of the shaft; and

an axial-throughput turbine fan on the shaft in the downstream housing section.

4,603,550

EXHAUST PARTICLE REMOVING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Motohiro Shinzawa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 28, 1985, Ser. No. 706,795

Claims priority, application Japan, Mar. 8, 1984, 59-42895

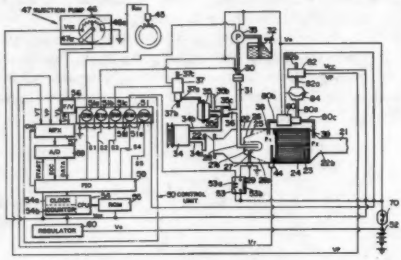
Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—274 **6 Claims**

1. An exhaust particle removing system for an internal combustion engine, comprising:

(a) a filter disposed in an engine exhaust passage for trapping particles suspended in exhaust gas;

(b) a burner for burning off the particles deposited on the filter;
(c) means for sensing the pressure in the exhaust passage at a point upstream of the filter;
(d) means for sensing the pressure in the exhaust passage at a point downstream of the filter;
(e) means for determining whether or not the sensed upstream pressure is lower than a preset level;
(f) means for, when the sensed upstream pressure is not lower than the preset level, deducing the degree of clogging of the filter on the basis of the sensed upstream and downstream pressures;



(g) means for, when the sensed upstream pressure is lower than the preset level, measuring a time elapsed since the moment at which the sensed upstream pressure dropped below the preset level;
(h) means for, when the sensed upstream pressure is lower than the preset level, deducing the degree of clogging of the filter on the basis of the time elapsed and the sensed upstream and downstream pressures obtained immediately prior to the moment at which the sensed upstream pressure dropped below the preset level; and
(i) means for controlling the burner on the basis of the deduced degree of clogging of the filter.

4,603,551

WAVE POWER CONVERTER

Peter Wood, 5 Budworth Close, Birkenhead, Merseyside, L43 9TJ, United Kingdom

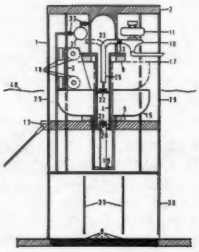
PCT No. PCT/GB83/00307, § 371 Date Jul. 25, 1984, § 102(e) Date Jul. 25, 1984, PCT Pub. No. WO84/02162, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 29, 1983, Ser. No. 637,047

Claims priority, application United Kingdom, Nov. 29, 1982, 8233949

Int. Cl.[4] F03B *13/12*

U.S. Cl. 60—496 **15 Claims**



1. A wave power converter for producing energy comprising:
(a) a relatively static floatable platform for floating in water;
(b) a floating motivator buoy, said motivator vertically reciprocating relative to said platform in response to passing waves in said water;
(c) a pump, said pump comprising:
(i) a cylinder barrel mounted to said platform;
(ii) a slidable piston, said piston reciprocating in said barrel with the movement of said motivator buoy;
(iii) a water inlet located below water level, said inlet having a first non-return valve to allow water into said pump on the downward movement of said motivator buoy; and,
(iv) a water outlet located above water level, said outlet having a second non-return valve for discharging water from said pump on the upward movement of said motivator buoy;
(d) an above-water pressurized container coupled to said water outlet, said container being partially filled with a compressible medium;
(e) a water powered turbine coupled to said container, said container supplying pressurized water to said turbine;
(f) a submersible hollow ballasted caisson anchored to said platform; and,
(g) means for filling said caisson with air so as to raise said caisson.

4,603,552

SAFETY DEVICE FOR TURBOCHARGED ENGINE

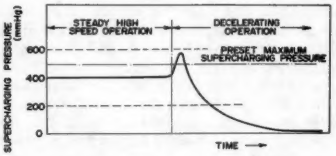
Yoshinobu Kido, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Mar. 1, 1984, Ser. No. 585,006

Claims priority, application Japan, Mar. 2, 1983, 58-34816

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—605 **13 Claims**



1. A safety device for a turbocharged engine which is provided with a turbocharger compriing a turbine disposed in the exhaust passage and a blower disposed in the intake passage and connected with the turbine by way of a rotary shaft and in which the throttle valve is disposed in the intake passage downstream of the blower, said safety device comprising an engine protective means for controlling the maximum supercharging pressure in the intake passage, at least one pressure sensor for detecting the supercharging pressure downstream of the blower, and a control circuit which actuates said engine protective means when the supercharging pressure detected by the pressure sensor continues to be higher than a preset supercharging pressure for a predetermined time interval, said control circuit including means for generating said predetermined time interval, said means for generating said predetermined time interval shortening said time interval as the difference between the detected supercharging pressure and said preset supercharging pressure increases.

4,603,553

BALLISTIC COLD WATER PIPE

Stuart L. Ridgway, Santa Monica, Calif., assignor to R & D Associates, Marina del Rey, Calif.

Filed Dec. 11, 1984, Ser. No. 680,352

Int. Cl.[4] F03G *7/04*

U.S. Cl. 60—641.7 **20 Claims**

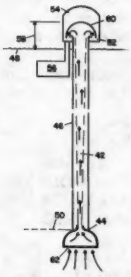
1. An ocean thermal energy type conversion system for use

near a large body of water having relatively cold water at a considerable depth beneath the surface thereof, comprising:

a source of warm water;

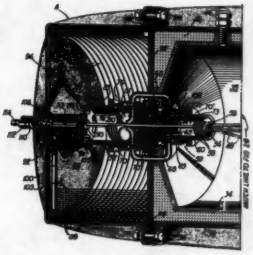
means for generating power from the difference in temperature between said warm water and said cold water; and

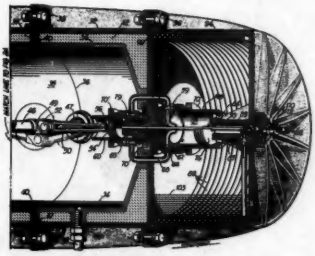
means for bringing said cold water up from the depths of



said body of water; said means including (1) a relatively straight pipe extending down into said body of water, (2) means for initially emptying said pipe of water, (3) nozzle means for directing a stream of water up into said pipe at high velocities with said stream spaced from the side walls of said pipe, and (4) means for collecting said water in the vicinity of the surface of said body of water.

mechanically linked with the high pressure piston and in selective and separate fluid communication with both the





condenser and the high pressure piston and cylinder assembly.

4,603,554

METHOD AND APPARATUS FOR EXTRACTING USEFUL ENERGY FROM A SUPERHEATED VAPOR ACTUATED POWER GENERATING DEVICE

Ralph J. Lagow, Anahuac, Tex., assignor to Thermal Engine Technology, Houston, Tex.

Filed Oct. 25, 1984, Ser. No. 664,792

Int. Cl.[4] F01K *11/00, 21/00*

U.S. Cl. 60—670 **19 Claims**

1. A power generating device comprising:

a source of superheated vapor;

a working shaft;

a high pressure piston and cylinder assembly located at least in part in a high pressure vessel containing superheated vapor, said high pressure piston being operatively linked to the working shaft and said high pressure piston and cylinder assembly being in selective fluid communication with the source of super-heated vapor; and

a final stage expansion piston and cylinder assembly located within the confines of a condenser for condensing the superheated vapor, said final stage expansion piston being

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4,603,555

APPARATUS FOR CONTAINING AN ENERGY STORAGE FLYWHEEL

Rayner M. Mayer, Yateley, England, assignor to The British Petroleum Company p.l.c., London, England

Filed May 7, 1984, Ser. No. 607,630

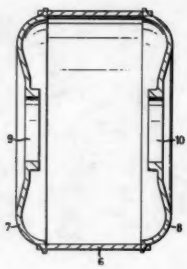
Claims priority, application United Kingdom, May 21, 1983, 8314142

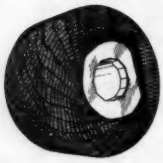
Int. Cl.[4] F15B *7/10*

U.S. Cl. 60—721 **19 Claims**

1. Apparatus suitable for containing a rotatable body which apparatus comprises at least two parts which together define a housing within which the rotatable body can be rotated chracterized in that the parts are secured together by a length of a high tensile strength tape which is wrapped around the parts to provide at least one layer of tape, overlapping at its edges, which envelops and is in contact with at least 50% of the surface area of the housing such that a point loading caused by the impact of the rotatable body, or a part thereof, with the inner surface of the housing is transformed into a loading over

the surface of the parts wrapped with tape, said housing being mounted and enclosed within a casing which is able to maintain a partial vacuum within the housing and means for maintaining the partial vacuum.





4,603,556

CONTROL METHOD AND APPARATUS FOR AN AIR CONDITIONER USING A HEAT PUMP

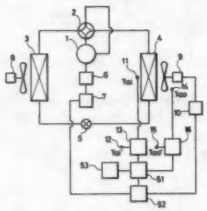
Kazutaka Suefuji; Hiromu Yasuda; Masakatsu Hayashi; Tetsuya Arata; Kensaku Oguni; Shigeaki Kuroda, all of Shimizu; Akira Atsumi, Niihari; Kyuhei Ishibane, Shimizu; Hirokiyo Terada, Shizuoka; Takao Senshu, Niihari, and Hiroshi Kogure, Sano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 8, 1985, Ser. No. 709,718

Claims priority, application Japan, Mar. 9, 1984, 59-44896

Int. Cl.[4] F25D *17/00*

U.S. Cl. 62—180 **12 Claims**



1. A control method for an air conditioner using a heat pump, having; a compressor; a variable speed electric motor for driving said compressor; a four-way valve; an expansion device; an outdoor heat exchanger; an indoor heat exchanger; and a variable speed blower for said indoor heat exchanger, comprising the steps of; detecting the temperature of inlet air drawn into said indoor heat exchanger; presetting the desired temperature value of said inlet air; detecting the temperature of outlet air blown from said indoor heat exchanger; presetting the desired higher temperature value of said outlet air temperature;

switching modes between:

the normal mode in which the r.p.m. of said compressor is controlled so that the temperature of said inlet air is made equal to the preset value, and

the hot air blowing mode in which the r.p.m. of said blower for said indoor heat exchanger is controlled while keeping the r.p.m. of said compressor high so that said outlet air temperature is made equal to the preset higher temperature value thereof,

said mode switching being dependent upon the degree of comfort based on the temperature in a room to be air conditioned.

4,603,557

REFRIGERATED-GOODS DISPLAY CASE

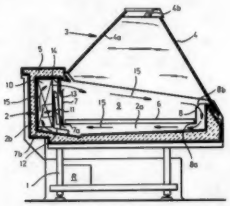
Manfred Halbmann, Mainz-Kostheim, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 26, 1984, Ser. No. 686,235

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1983, 3347361

Int. Cl.[4] A47F *3/04*

U.S. Cl. 62—255 **12 Claims**



1. A refrigerated-goods display case comprising:

a housing formed with a goods-display compartment having a platform upon which goods are displayed, a front side from which goods on said platform can be viewed, a rear side opposite said front side and a vertical rear wall at said rear side spaced rearwardly of said goods display compartment;

means including a blower in said housing at said rear side and rearwardly of said compartment but forwardly of said wall for circulating a cooling airstream over goods on said platform and along said wall; and

means including a heat exchanger in said housing at said rear side along said wall and rearwardly of said compartment for cooling said airstream, said heat exchanger including a finned planar heat exchanger traversed by a refrigerant and disposed along said wall, the fins of said heat exchanger being separated along the length of said wall into spaced apart finned sections, said means for circulating being located in spaces between said finned sections.

4,603,558

RECEPTACLE FOR MOUNTING IN A FREEZER FOR ASSISTING IN THE DEFROSTING THEREOF

Michael J. McAdams, 12 Drumrallagh Estate, Strabane, County Tyrone, Northern Ireland

Filed Mar. 28, 1984, Ser. No. 594,360

Claims priority, application United Kingdom, Mar. 31, 1983, 8309080

Int. Cl.[4] F25D *21/00*

U.S. Cl. 62—272 **13 Claims**

1. Refrigeration defrosting apparatus comprising

cooling means having a surface adapted to have its temperature lowered by a refrigeration process,

liner means removably mounted adjacent said cooling means and having a first surface snugly conformable to said cooling means surface and an opposite surface adapted to receive frost resulting from said lowered temperature, and

means for removably connecting said liner means to said cooling means, said liner means substantially covering said cooling means surface to prevent communication between said cooling means surface and ambient air, whereby ice resulting from condensation of water vapor in the ambient air is formed on said opposite surface of said liner means.

4,603,559

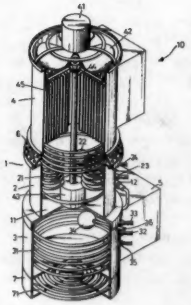
WATER-COOLED AIR CONDITIONER

Ming W. Wu, No. 157, Sec. 1 Chung-Hwa Road, Tainan, Taiwan

Filed Jul. 8, 1985, Ser. No. 752,634

Int. Cl.[4] F25D *17/02*

U.S. Cl. 62—434 **6 Claims**



1. An improved water-cooled air conditioner comprising

a main body;

a condenser with a condensing coil formed therein being disposed in the middle portion of the main body, said condenser furnished with a floating valve, said condenser further provided in the periphery thereof with an inlet and a control valve such that the inlet and the control valve cooperate with the floating valve to regulate the level of water contained in the condenser or to clean the condenser;

an evaporator with a cooling coil received therein being disposed in the lower portion of the main body and separated from said condenser, an expansion valve connecting the cooling coil of the evaporator and the condensing coil of the condenser, said evaporator provided in the interior thereof with a floating valve and at the periphery thereof with an inlet and a control valve such that the floating valve is associated with the inlet and the control valve to regulate the level of water contained in the evaporator;

cooling means being disposed in the upper portion of the main body and communicating with said condenser, said cooling means provided at its center with a sprayer, a water pump disposed to be situated within the water contained in the condenser and being connected to the lower end of the sprayer, a plurality of dissipating plates disposed in the cooling means and located between the upper end of the sprayer and the condensing coil of the condenser, and an electric fan capable of being driven by a motor being disposed on the top of the cooling means and beyond said sprayer.

4,603,560

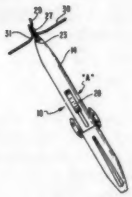
APPARATUS FOR REMOVING SNAGS FROM FABRIC

Eugene E. Pietrowski, 153 Cooper Ave., Iselin, N.J. 08830

Filed May 3, 1984, Ser. No. 606,521

Int. Cl.[4] D04B *3/00*

U.S. Cl. 66—1 R **12 Claims**



1. A snag remover device for extracting snags from the surface of a fabric, comprising:

a hollow housing having an opening on a distal end;

a guide member disposed within said housing; and

a plurality of spaced-apart slide members respectively disposed for slideable movement relative to said guide member between a respective retracted position and a respective operable position, each slide member having a snag extractor on a distal end thereof, each of said snag extractors protruding from said opening in said housing when its corresponding slide member is disposed in said operable position, but wherein there being only one slide member in an operable position at any one time, and hence, only one snag extractor protruding from said housing opening.

4,603,561

CROCHET TOOLS FOR PRODUCING STRIPS ON A CROCHET GALLOON MACHINE

Josef Berger, Hainstrasse 11, Schwaebisch Gmuend-Grossdeinbach, and Johann Berger, Obere Schloss-Strasse 114, Alfdorf, both of Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 560,003

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 32440146; Nov. 27, 1982, 82333807[U]; European Pat. Off., Nov. 19, 1983, 831115860

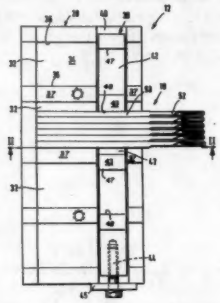
Int. Cl.[4] C03B *15/02*

U.S. Cl. 66—203 **12 Claims**

1. Crochet tools for producing bands on a crochet galloon machine, characterised by the following features:

a needle bar of said crochet galloon machine having a plurality of needles and a clamp device in which needle stems of

said needles are clamped over more than half the length thereof, and;



a knocking-over bar fastened to said machine having a free straight edge which adjoins closely those parts of said needles projecting outwardly beyond said clamp device.

4,603,562

BOBBIN SUPPORTING TEXTILE STRANDS TO BE SUBJECTED TO A HEAT AND/OR WET TREATMENT

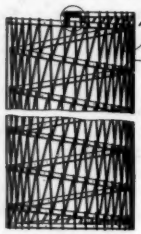
Hans Meyer, and Viggo E. Hartmann, both of Silkeborg, Denmark, assignors to A/S Kaj Neckelmann, Syntetisk Fiber Industri, Silkeborg, Denmark

Filed Aug. 29, 1984, Ser. No. 645,284

Claims priority, application Denmark, Sep. 13, 1983, 4161/83

Int. Cl.⁴ B65H *75/20*; D06B *5/18*

U.S. Cl. 68—198 **14 Claims**



1. A bobbin for supporting textile strands, comprising:

means defining a substantially cylindrical grating, said grating comprising a plurality of grating elements, each of said grating elements defining a slot elongated in the direction of the axis of said cylinder, each said slot having axial ends which are curved with a first diameter, each said slot having a radially outer surface connecting said curved ends, at least a portion of said radially outer surface being directed outward from said curved ends so that an intermediate portion of said outer surface is positioned substantially radially outward of any straight line connecting said curved ends;

connecting means, at least two of said connecting means passing through each of said slots, said connecting means being curved in section with a diameter substantially equal to said first diameter; and

means for biasing said at least two connecting means away from one another in the axial direction,

whereby when said connecting means are biased to said axial ends, said intermediate portion assumes a position radially outward from said connecting means.

4,603,563

MAGNETIC DOOR LOCKING SYSTEM

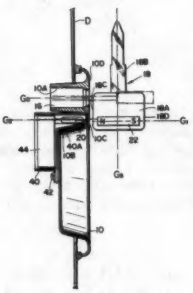
Haruo Mochida, Kanagawa; Keiichi Shimizu, and Shigetami Okuya, both of Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd. and Kokusan Kinzoku Kogyo Kabushiki Kaisha, both of, Japan

Filed Aug. 3, 1983, Ser. No. 519,902

Claims priority, application Japan, Aug. 10, 1982, 57-137841; Aug. 10, 1982, 57-137842

Int. Cl.⁴ E05B *47/00*

U.S. Cl. 70—276 **14 Claims**



1. A magnetic locking system in combination with a door for locking said door to a fixed member comprising:

a key cylinder mounted in said door and adapted to be operatively associated with a door locking mechanism;

a magnetic sensor connected to said door in the vicinity of said key cylinder, said magnetic sensor being adapted to operate when a predetermined magnitude of magnetic force is applied thereto in a direction substantially parallel with a given axis of said magnetic sensor;

control means mounted to said door for locking said door to the fixed member when said magnetic sensor operates; and

a magnet-mounted key means for engagement with said key cylinder to turn the same about its axis and having a key head and magnet piece fixed thereto, said magnet piece having at axially opposed end portions north and south poles, respectively, defining a polar axis and being adapted to apply said predetermined magnitude of magnetic force to actuate said sensor when positioned adjacent said magnetic sensor with the polar axis extending substantially parallel with said given axis of said magnetic sensor;

said magnet piece of said key means being arranged in said key head so that when the key means is operatively engaged with said key cylinder, the polar axis of said magnet piece describes a plane which intersects said given axis of said magnetic sensor as said key means turns the key cylinder about its axis.

4,603,564

LOCK CYLINDER WITH INTEGRATED ELECTROMAGNETIC LOCKING SYSTEM

Arno Kleinhäny, Hinwil, and Walter Gutmann, Wetzikon, both of Switzerland, assignors to Bauer Kaba AG, Wetzikon, Switzerland

PCT No. PCT/CH82/00078, § 371 Date Jan. 31, 1983, § 102(e) Date Jan. 31, 1983, PCT Pub. No. WO82/04459, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 15, 1982, Ser. No. 464,504

Claims priority, application Switzerland, Jun. 17, 1981, 4006/81

Int. Cl.⁴ E05B *47/00*

U.S. Cl. 70—277 **5 Claims**

1. A cylinder lock with integrated and independently opera-

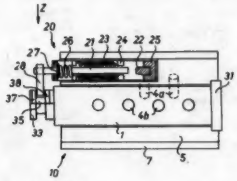
ble mechanical and electromagnetic locking mechanisms, comprising:

a cylinder housing with a recess defining a main medium plane through a longitudinal axis of said recess;

a solenoid mounted in said recess and having an axially movable, electromagnetically operated armature and a locking member extending from an end of said armature;

a rotor mounted in said housing;

locking means, non-rotatably mounted on said rotor and selectively engagable with said locking member, for per-



mitting or preventing rotation of said rotor in said housing, said locking means including a peripheral free-running slot which receives said locking member to permit rotation of said rotor, and a locking slot which receives said locking member to prevent rotation of said rotor; and

mechanical tumbler means, mounted in said housing in longitudinal medium planes and releasably engagable with said rotor in response to a key, for permitting or preventing rotation of said rotor in said housing independently of said solenoid, said longitudinal medium planes being located at equal angles on opposite sides of said main medium plane.

4,603,565

CYLINDER LOCK EMBODYING AT LEAST TWO ROWS OF TUMBLER PIN BORES AND OPPOSED ROWS OF LOCKING PINS WHICH INTERACT TO PRECLUDE PICKING

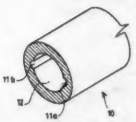
Maximilian E. F. Strassmeir, 25 Lehmann Avenue, Liverpool, New South Wales, Australia 2170

Filed Nov. 17, 1983, Ser. No. 552,505

Claims priority, application Australia, Nov. 23, 1982, PF6936

Int. Cl.⁴ E05B *27/06*

U.S. Cl. 70—358 **13 Claims**



1. A cylinder lock assembly comprising:

a hollow lock body;

a barrel rotatably mounted in the lock body having a keyway extending longitudinally from one end thereof;

a plurality of tumbler pin bores located in said barrel provided in at least two rows wherein each tumbler pin bore communicates with said keyway;

a plurality of tumbler pins wherein each tumbler pin is located in an associated tumbler pin bore;

a multiplicity of locking pin bores located in said barrel in at least two rows wherein each locking pin bore is oriented normal to an adjacent pair of tumbler pin bores contained in an adjoining row and is interposed therebetween;

a multiplicity of locking pins and each said locking pin being located in an associated locking pin bore so that in a locked position each said locking pin engages with an adjacent pair of tumbler pins on opposed sides thereof to thereby prevent rotational movement of the barrel relative to the lock body; and

withdrawal means on each locking pin so as to enable retraction of the locking pins from engagement with the lock body, thereby allowing the barrel to attain an unlocked position permitting rotation relative to the lock body upon insertion of a key in said keyway.

4,603,566

SAFETY LOCK

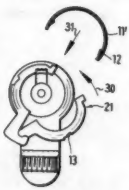
Juergen Kruehn, Berlin, Fed. Rep. of Germany, and Kurt Prunbauer, Herzogenburg, Austria, assignors to Zeiss Ikon AG, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,793

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418680

Int. Cl.⁴ E05B *17/04*

U.S. Cl. 70—380 **18 Claims**



1. In a lock cylinder, an improved lock web ring and retaining means comprising:

a lock web ring divided in a longitudinal direction forming two adjoining halves with a hinge connection between said two halves in the region of a lock web and having a radially projecting peg on each half at a region opposite said lock web; and

a retaining means having a central opening selectively placeable over said pegs to hold said two pegs together in a clamped manner.

4,603,567

PROGRAMMABLE MANUFACTURING SYSTEM FOR LOAD/SUPPORT ARMS FOR MAGNETIC DISK DRIVE DATA STORAGE SYSTEMS

Ronald A. Smith, Los Gatos; James M. Jackson, Menlo Park; Carl L. Lehfeldt, Los Gatos; Leonard P. Cygnarowicz; Khosro Moshfegh, both of San Jose; Kenneth L. Blanchard, Santa Clara, and Kenneth J. Nelson, Fremont, all of Calif., assignors to Ronald A. Smith & Associates, Campbell, Calif.

Filed Jul. 19, 1985, Ser. No. 756,600

Int. Cl.⁴ B21B *37/12*

U.S. Cl. 72—8 **19 Claims**

1. An apparatus for bending a plurality of planar spring elements extending perpendicularly at equally spaced intervals from a longitudinal fret, and shearing only those spring elements meeting a specified thickness, load, and deflection criteria from the fret comprising, in combination,

a. a plurality of walking beam units each having means for engaging and transporting the fret in steps longitudinally, the walking beam units sequentially positioning each extending spring element along the longitudinal fret at a series of stations;

b. a thickness measuring station located between first and second walking beam units having means for measuring the thickness of each planar spring element extending

from the fret and generating a corresponding electrical "thickness" signal;

c. a forming station located betweeen second and third walking beam units having,

(i) a bending means for engaging and forming each planar spring element around a curved mandrel surface, and

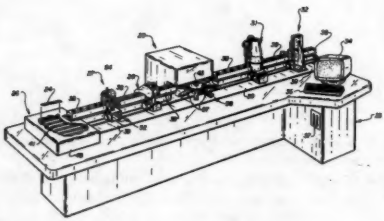
(ii) a first load sensing means engaging the spring element positioned at the forming station after it has been formed around the mandrel surface and released by the bending means for deflecting each spring element to a specified position and for sensing force imparted by each spring element at that deflected position generating a corresponding first electrical "load" signal,

d. an oven station located between the third and fourth walking beam units for stress relieving the fret and spring elements extending along its length,

e. a thermal adjust station located between fourth and fifth walking beam units having,

(i) a second load sensing means engaging each spring element positioned at the adjust station for deflecting each spring element to the specified position, and for continuously sensing force imparted by each so deflected element generating a corresponding second electrical "load" signal, and

(ii) a radiating means thermally heating the deflected



spring element for stress relieving the deflected spring element decreasing the force it imparts to the second load sensing means,

g. a memory controller means receiving "thickness" signals from the measuring station, first "load" signals from the forming station, and second "load" signals from the thermal adjust station for controlling:

(i) an angular extend to which each spring element is formed around the curved mandrel surface by the bending means,

(ii) exposure of each spring element to the radiating means stress relieving each element at the thermal adjust station, thereby, adjusting load imparted by each spring element to the second load sensing means when deflected to the specified position to the specified load if possible,

(iii) engagement and release of each spring element by the first and second load sensing means at their respective stations, and

(iv) stepping of the plurality of walking beam units transporting the fret longitudinally, and

h. a shear station located between fifth and sixth walking beam units having a shear means controlled by the memory controller means for shearing only those spring elements meeting the specified thickness, load and deflection criteria from the fret.

4,603,568

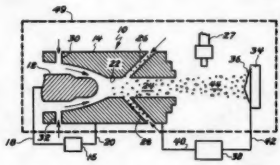
METHOD OF FABRICATING BIMETAL VARIABLE EXHAUST NOZZLE FLAPS AND SEALS

Paul A. Siemers, Clifton Park; Melvin R. Jackson, Schenectady, and Stephen F. Rutkowski, Duanesburg, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 30, 1985, Ser. No. 739,345

Int. Cl.[4] B21D *22/00, 31/00, 53/92*

U.S. Cl. 72—47 **9 Claims**



1. A method of forming a generally planar component of a jet engine which comprises,

providing a preformed sheet of a superalloy, coiling the sheet into a tube,

plasma spraying a layer of a superalloy onto said preformed sheet while in the form of a tube,

uncoiling the preformed sheet with the superalloy deposit, and

forming the uncoiled sheet into said generally planar component.

4,603,569

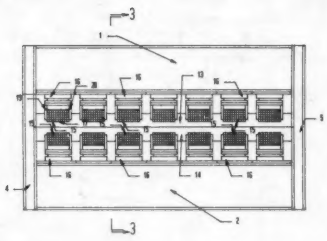
PRESSURE CONTROLLED PLATE MILL

Tadeusz Sendzimir, P.O. Box 1350, Waterbury, Conn. 06720

Continuation-in-part of Ser. No. 632,953, Jul. 20, 1984, abandoned. This application May 15, 1985, Ser. No. 734,469

Int. Cl.[4] B21B *13/14, 29/00, 31/32, 35/08*

U.S. Cl. 72—245 **19 Claims**



1. A mill for rolling flat workpieces, such as plates, sheets, strips and the like, from plastically deformable material, said mill comprising two housings, an upper and a lower backing beam each having its ends attached to said housings, an upper and a lower work roll supported by said upper and lower backing beams respectively, means maintaining the axes of said upper and lower work rolls in the same vertical plane, and means operatively connected to said rolls for rotating said upper and lower work rolls in opposite directions, a plurality of roller-carrying pressure transmitting elements for each of said upper and lower work rolls, the pressure transmitting elements for each roll being disposed between said roll and the adjacent one of said backing beams, each of said pressure transmitting elements of each roll being individually attached to said adjacent backing beam, said pressure transmitting elements of each work roll being evenly spaced along the face of their respective work roll with their rollers in operating contact with adjacent sectors of their respective work roll, said

pressure transmitting elements for said upper work roll and said lower work roll being equal in number and opposed, each of said pressure transmitting elements of at least one of said upper and lower work rolls having individually controllable fluid pressure means connected thereto, said pressure transmitting elements transmitting rolling pressure to said sectors of said at least one work roll through said individually controllable fluid pressure means.

4,603,570

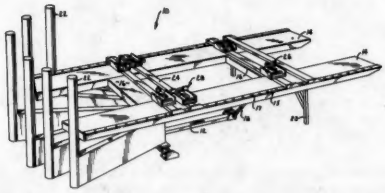
UNIVERSAL DEDICATED FIXTURE FOR FRAME STRAIGHTENING RACK

Freddie H. Dehn, Box 63, Excelsior Springs, Mo. 64024

Filed Dec. 12, 1983, Ser. No. 559,639

Int. Cl.⁴ B21D *1/12*

U.S. Cl. 72—305 **4 Claims**



1. A fixture assembly for use in conjunction with a vehicle frame straightening rack and a movable elongated beam adapted to be coupled to both said vehicle and said rack during the straightening operation, said vehicle frame being characterized by a series of alignment openings, said fixture assembly comprising:

flat plate means spanning said beam;

releasable means for locking said flat plate to said beam and for accommodating sliding movement of said flat plate relative to said beam;

first and second guide plates rigid with said flat plate means and extending downwardly from the latter on opposite sides of and in close proximity to said beam;

first and second elongated side braces rigidly coupled with said flat plate means in parallel spaced apart relationship;

first and second elongated keepers rigidly coupled with said first and second side braces and cooperating with the latter to present a closed track;

base plate means slidably received by said track means and held against vertical displacement by said keepers;

arm means rigidly coupled with said base plate means;

sleeve means rigid with one end of said arm means

means for locking said base plate means against movement relative to said flat plate means; and

stanchion means releasably received by said sleeve for rigidly engaging said vehicle framd; and

means for holding said stanchion means rigid relative to said sleeve,

whereby when a straightening force is applied to a portion of said vehicle frame that portion of said vehicle frame engaged by the stanchion means will be held stationary.

4,603,571

APPARATUS FOR DRAWING CIRCULAR CUPS FROM NON-CIRCULAR BLANKS

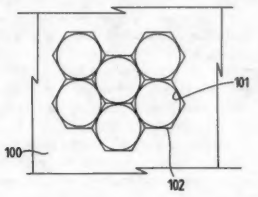
Ewald J. H. Wessels, Van Rheede, Alexandra Road, Wynberg 7700, South Africa

Filed Apr. 19, 1985, Ser. No. 724,915

Claims priority, application South Africa, Aug. 7, 1984, 84/6126

Int. Cl.⁴ B21D *22/00*

U.S. Cl. 72—349 **10 Claims**



1. An apparatus for drawing a metal cup from a metal sheet, comprising

a blanking means for providing a non-circular blank from a metal sheet,

a first drawing means for drawing a non-circular cup from the non-circular blank in such a way that more stretching takes place in those areas of the blank where the perimeter is closer to the geometrical center of the blank than the stretching which takes place in those areas of the blank where the perimeter is further away from the geometrical center of the blank, and

a second drawing means for drawing a circular cup from the non-circular cup.

4,603,572

DEVICE AND METHOD FOR BENDING CORRUGATED PLATES

Jacobus A. T. Van Breukelen, and Theodorus Westerveld, both of Soest, Netherlands, assignors to Dupral B.V., Netherlands

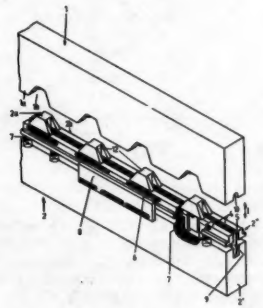
PCT No. PCT/NL83/00035, § 371 Date May 9, 1984, § 102(e) Date May 9, 1984, PCT Pub. No. WO84/00907, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 9, 1983, Ser. No. 610,644

Claims priority, application Netherlands, Sep. 9, 1982, 8203509

Int. Cl.⁴ B21D *13/02*

U.S. Cl. 72—385 **8 Claims**



1. A device for bending plates having a corrugated profile, comprising a pair of press beams which are positioned parallel one relative to the other and are mounted to be moved toward and away from each other in a transverse direction, said one or

lower press beam having on its upper edge a series of alternating recesses and extentions which correspond with an exterior valley profile and interior pressed profile respectively, of the plate to be bent, while said second or upper press beam has a series of alternating extentions and recesses which correspond with the interior valley profile and the exterior pressed profile respectively, and in which on the side walls of the recesses in said upper pressed beam, adjacent the junction of said side walls and the bottoms of said recesses, a protruberance is provided to fully engage into a corresponding cut-out in the side wall of the underlying extention of the lower pressed beam when the two pressed beams are brought together, said lower pressed beam having a punch portion at its upper face extending in the longitudinal direction of said face to be fully caught in a corresponding longitudinal groove in the lower faces of the raised portion of the upper pressed beam, wherein the punch portion is moveably mounted between an inoperative position, in which the punch portion has its operative upper edge sunk into a groove extending across all of said recesses of the lower press beam, and an operative position, in which the punch portion has its operative upper edge projecting through said groove upwards beyond the bottoms of the recesses in the lower press beam.

4,603,573

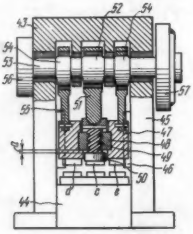
PRESS

Oleg A. Ganago; Anatoly V. Safonov; Boris A. Stepanov; Vadim N. Subich; Alexandr D. Frolov, all of Moscow; Nikolai A. Lobanov, Kolomna; Yakov L. Lumer, Kolomna; Alexei M. Xenofontov, Kolomna; Leonid I. Rudman; Alexandr D. Lebed, both of Kiev; Vasha I. Mamatsashvili, Tbilisi; Valery F. Kljuchnikov, Kolomna; Dzhemal I. Birkadze, Tbilisi; Sergei S. Shklyarman, Kolomna; Nikolai A. Gordeev, Moskovskaya oblast; Vasily Y. Golovin, Voronezh; Alexandr T. Kruk, Voronezh; Ivan F. Yakovenko, Voronezh; Vladimir V. Novikov, Voronezh; Andrei M. Grishkov, Moscow; Valery N. Gorozhankin, Voronezh; Vladmir E. Svistunov, Moscow; Jury A. Bocharov, Moscow, and Jury N. Sergeev, Moscow, all of U.S.S.R., assignors to Moskovskoe Vysshee Tekhnicheskoe Uchilische Imeni N.E. Baumana and Zavod-Vtuz Pri Moskovskom Avtomobilnom Zavode Imeni I.A. Likhacheva, both of Moscow, U.S.S.R.

Division of Ser. No. 507,078, Jun. 23, 1983, Pat. No. 4,559,807. This application Jul. 12, 1985, Ser. No. 754,331

Int. Cl.[4] B21B *25/00*

U.S. Cl. 72—454 **5 Claims**



1. A press comprising: two crossheads spaced at a distance from one another; uprights interconnecting said crossheads; said crossheads and uprights forming a frame of said press; a ram mounted for translatory motion between said uprights; a nut with a non-self-stopping thread, said nut being built into said ram; another ram mounted for translatory motion between said uprights; a die holder mounted in the second-mentioned ram for translatory motion therewith and for rotation thereabout; a screw rigidly connected to said die holder and cooperating with said nut during translatory motion of the first-mentioned ram and forming a kinematic couple therewith; drive means to enable translatory motion of the die holder, said drive means including an electric motor, a shaft with a first eccentric, a pair of second eccentrics, said second eccentrics being offset circumferentially from said first eccentric, said shaft mounted in one of said crossheads operatively connected to said electric motor, a connecting rod having one end thereof operatively connected to said screw and another end operatively connected to the first eccentric of said shaft; and wherein said first drive includes two connecting rods linked to said first ram, said two connecting rods operatively coupled to respective ones of said second eccentrics; said connecting rods causing said die holder to both translate and rotate relative to said press.

4,603,574

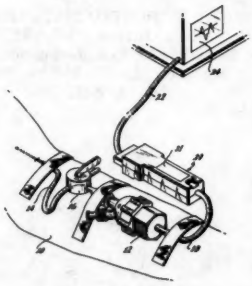
BLOOD PRESSURE TRANSDUCER TESTER

Jacob J. Norman, Westminster, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jan. 22, 1985, Ser. No. 692,976

Int. Cl.[4] G01C *25/00*

U.S. Cl. 73—4 R **11 Claims**



1. A blood pressure transducer system, comprising:

(a) a transducer assembly adapted to be attached to a patient and including a transducer having a housing;

(b) electrical testing means for causing said transducer assembly to put out a simulated pressure signal corresponding to a predetermined blood pressure level; and

(c) actuating means located in said transducer for selectively actuating said testing means, said actuating means including a pair of series-connected switches located on opposite sides of said housing.

4,603,575

ELEMENTAL TRACER SYSTEM FOR DETERMINING THE SOURCE AREAS OF POLLUTION AEROSOL

Kenneth A. Rahn, and Douglas H. Lowenthal, both of Narragansett, R.I., assignors to Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, Providence, R.I.

Filed Dec. 27, 1984, Ser. No. 686,655

Int. Cl.[4] G01N *15/06*

U.S. Cl. 73—28 **9 Claims**

1. A method to determine regional sources of pollution aerosol which includes:

(a) selecting empirically a small number of suitable tracer elements which are pollution-derived, associated with submicron-sized particles, and accurately analyzable in the aerosol;

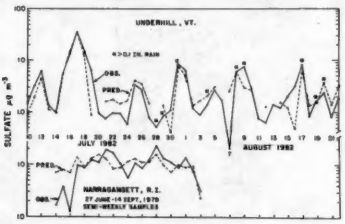
(b) measuring the concentrations of each tracer element in multiple samples of regionally-representative aerosol at multiple sites in each source region whose signature is to be determined;

(c) expressing the measured results as ratios to one of the tracer elements;

(d) defining the elemental signature of the source region as

the collection of elemental ratios and associated standard deviations which best represents that region's aerosol;

(e) determining the source region's signature from modes in the logarithmic frequency distributions of the elemental ratios of samples taken in source region;



(f) measuring the concentrations of each tracer element in multiple samples of an aerosol from a receptor region;

(g) comparing the elemental ratios from the receptor region to the signatures from possible source regions to determine the most probable source region.

4,603,576

APPARATUS FOR PROVIDING FLUID PRESSURE FOR TESTING A SEAL

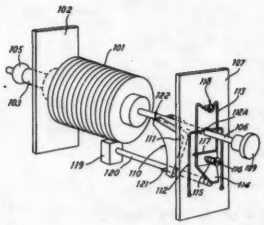
Herbert J. C. Spencer, Ascot, England, assignor to Telspec Limited, Rochester, England

Division of Ser. No. 630,583, Jul. 10, 1984, Pat. No. 4,527,804. This application Dec. 5, 1984, Ser. No. 678,672

Claims priority, application United Kingdom, Jul. 19, 1983, 8319497; Aug. 17, 1983, 8322096

Int. Cl.[4] G01M *3/28*

U.S. Cl. 73—40 **8 Claims**



1. A device for use in testing the sealing of a space against fluid leakage comprising a body portion defining an orifice to be coupled to said space, a movable member movable with respect to said body portion to convert a mechanical force applied to said movable member into a fluid pressure applied at said orifice, means for biasing said movable member whereby, when said device is coupled to said space, said movable member initially adopts a position of substantial equilibrium with the mechanical force applied thereto substantially balanced by the fluid pressure prevailing within said space, and deviation registering means for registering deviation of said movable member from said initial position of substantial equilibrium as an indication of fluid leakage said deviation registering means comprising determining means for determining movement of said movable member and reset means for establishing a zero position of said determining means corresponding to said position of substantial equilibrium of said movable member.

4,603,577

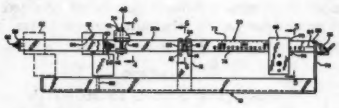
APPARATUS FOR DETERMINING THE SWING INERTIA OF GOLF CLUBS

Louis W. Johnson, and Bruce G. Johnson, both of 2435 Prairie Rd., Eugene, Oreg. 97402

Continuation-in-part of Ser. No. 525,941, Aug. 24, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 684,610

Int. Cl.[4] G01M *1/12*

U.S. Cl. 73—65 **8 Claims**



1. A scale for weighing golf clubs to determine the swing inertia thereof, said clubs having a head portion, a shaft portion, and a grip portion for receiving the golfer's hands in adjacent gripped relation, said scale comprising

a base,

a balance beam having pivot support on said base,

calibrations on one of said base and beam providing a set of values of swing inertia,

and support means on said balance beam having forward and rearward support portions for supporting a golf club in parallel relation with said balance beam,

said rearward support portion being adjustable along said balance beam and arranged to contact the grip portion of the club and locate the club such that the axis of rotation of a person's normal grip on said grip portion for swinging the club is disposed vertically above the pivotal axis of said balance beam,

said calibrations comprising values determined by multiplying the head weight of the club by the length of the club extending from the said pivotal axis to the center of gravity of the head.

4,603,578

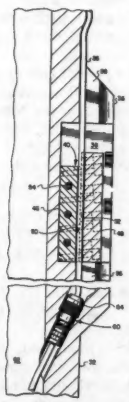
SIDE ENTRY SUB WITH TENSION RELEASE WIRELINE CABLE CLAMP

John W. Stoltz, Fort Worth, Tex., assignor to Gearhart Industries, Inc., Ft. Worth, Tex.

Filed Oct. 10, 1984, Ser. No. 659,251

Int. Cl.[4] E21B *17/00*

U.S. Cl. 73—151 **11 Claims**



1. A side entry sub, which comprises:

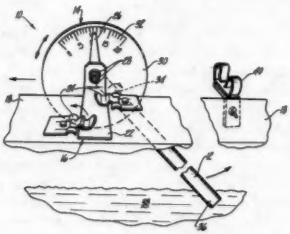
an elongated tubular member having a pair of ends and a cylindrical wall and a longitudinal bore;
a port formed in said wall intermediate said ends for running a cable from the exterior of said tubular member into said longitudinal bore;
and clamp means for preventing movement of said cable axially with respect to said tubular member, said clamp means being releasable responsive to a tension force on said cable greater than a preselected amount to allow said cable to move freely axially with respect to said tubular member with said clamp means being retained with said elongated tubular member after release of said cable.

4,603,579

TROLLING SPEED INDICATOR

Richard L. Shaum, Davison, and Edward A. Burr, Grand Blanc, both of Mich., assignors to Richard L. Schaum, Davison, Mich.

Filed Aug. 31, 1984, Ser. No. 646,645
Int. Cl.[4] G01P *5/04*
U.S. Cl. 73—186 **4 Claims**



1. An indicator for determining the velocity of a nautical vessel, said indicator comprising:
mounting means for detachably mounting said indicator to the gunnel of the nautical vessel, said mounting means comprising at least one clip secured to the gunnel of the vessel and including a portion biased against said gunnel;
an elongated flange member having first and second ends wherein said first end is secured to said vessel by said biased portion of said clip of said mounting means;
a pointer adjustably fixedly secured parailel to said second end of said flange member;
indicating means rotatably secured to said second end of said flange member, said indicating means comprising a velocity scale disposed on an annular disk wherein said annular disk is axially and rotatably mounted to said second end of said flange member and wherein said annular disk is disposed parallel to and spaced apart from said fixed pointer, and said fixed pointer and said annular disk being mounted on a common shaft whereby calibration can be accomplished by adjusting the rotational relationship between the pointer and the disk; and
an elongated submersible rod having a first end fixedly secured to said annular disk.

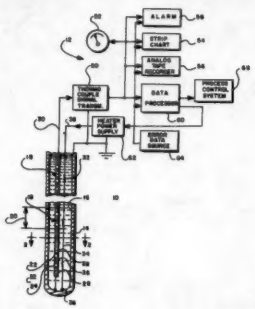
4,603,580

UNICABLE LIQUID LEVEL SENSING SYSTEM

James P. Waring, Rockville, Md., assignor to Scandpower, Inc., Bethesda, Md.

Filed Feb. 20, 1985, Ser. No. 703,437
Int. Cl.[4] G01F *23/22*
U.S. Cl. 73—295 **8 Claims**

1. In a liquid level monitoring probe having an axially elongated sheathing, an electrically insulating and heat conductive body enclosed by said sheathing, a plurality of temperature sensors respectively embedded in said body within separate, axially spaced measurement zones, each of said sensors having at least two thermocouple junctions, wherein the two thermocouple junctions of each temperature sensor are located in the respective measurement zone, and means within said body for unequally heating the two thermocouple junctions within each respective measurement zone, the improvement comprising,



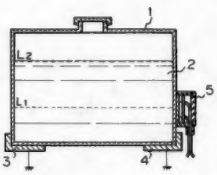
conductor means electrically interconnecting all of the temperature sensors and thereby all of the thermocouple junctions in series for producing a combined output signal and axial heat flow control means operatively connected to said heating means for modifying the combined output signal.

4,603,581

SENSING APPARATUS

Kouichi Yamanoue; Junji Kitagawa; Shigeyuki Akita, all of Okazaki, and Akira Kuno, Oobu, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Jan. 31, 1985, Ser. No. 697,005
Claims priority, application Japan, Feb. 14, 1984, 59-26839
Int. Cl.[4] G01F *23/26*
U.S. Cl. 73—304 C **25 Claims**



1. A sensing apparatus for sensing existence of a substance, comprising:
containing means for containing the substance, said containing means being formed of an electrically insulating substance;
electroconductive support means for electrically grounding at least one end of said containing means;
a first electrode member mounted directly on a surface of said containing means;
a second electrode member mounted directly on said surface of said containing means, and arranged at an opposing position a predetermined distance away from and electrically isolated from said first electrode member; and
electric circuit means for detecting a capacitance formed between said first and second electrodes, said electric circuit means being operatively connected to said first and second electrode members and to said ground;
said first and second electrode members being operatively connected by a first capacitance (Ca) formed by a part of said containing means between said first and second elec-

trode members and a second capacitance (Cc) formed by said substance to be sensed between the first and second electrode members in said containing means, and

said electric circuit means outputting a signal in response to changes in said first and second capacitances with respect to a reference capacitance circuit (Cb, Cd) to ground.

4,603,582

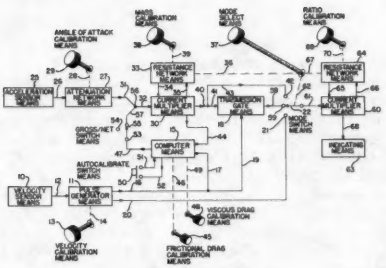
INERTIAL DYNAMOMETER SYSTEM AND METHOD FOR MEASURING AND INDICATING GROSS HORSEPOWER

Harold G. Middleton, 418 SW. 159th St., Seattle, Wash. 98166

Filed Apr. 16, 1984, Ser. No. 600,844

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—511 **27 Claims**



1. Apparatus, for use in a vehicle having a prime mover, a mass and a direction of motion, for providing instantaneous indication of the gross horsepower output of the prime mover comprising:

(a) means for generating a signal with a value continuously proportional to the instantaneous inertial acceleration of the vehicle, said means having a sensitive axis adjustable to be parallel to the direction of motion of said vehicle;

(b) means for generating a signal with a value continuously proportional to the instantaneous velocity of the vehicle and further comprising means for adjusting said generating means to account for the drive ratio of said vehicle;

(c) means for providing a signal with a value continuously proproportional to the aerodynamic drag of the vehicle and further comprising means for adjusting said means to calibrate said means to accurately represent the aerodynamic characteristics of the vehicle;

(d) means for providing a signal with a value continuously proportional to the friction drag of the vehicle and further comprising means to calibrate said means to accurately represent the frictional drag characteristics of the vehicle;

(e) means for providing a signal with a value continuously proportional to the viscous drag of the vehicle and further comprising means to calibrate said means to accurately reflect the viscous drag characteristics of the vehicle;

(f) means for providing a signal proportional to the mass of the vehicle multiplied by the acceleration of the vehicle;

(g) means for accepting said signals and providing a signal having a value proportional to said gross horsepower;

(h) means for accepting a signal having a value proportional to an operating parameter of said vehicle and providing a visual indication of the value of said signs.

4,603,583

METHOD FOR THE ULTRASONIC TESTING OF FERRITIC PARTS HAVING A CLADDING

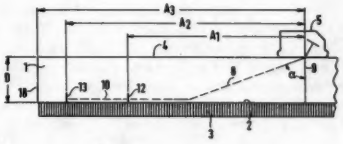
Roland Heumüller, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,062

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413097

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—596 **4 Claims**



1. Method for the ultrasonic testing of ferritic bodies having a cladding surface for faults in the cladding surface, a surface opposite the cladding surface, a cladding disposed on the cladding surface, an ultrasound transmitter radiating from the surface opposite the cladding surface into the body at an angle relative to the cladding surface, and a receiver disposed on the surface opposite the cladding surface, for receiving reflections emanating from a fault in the body, which comprises radiating longitudinal waves from the transmitter into the body at an angle between 70° and 86° relative to the perpendicular to the cladding surface causing the waves to travel in a direction substantially parallel to the cladding surface in the body.

4,603,584

ACOUSTIC DETECTION OF DEFECTS IN STRUCTURES

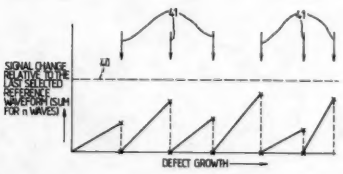
Peter M. Bartle, Suffolk, and James C. Needham, Essex, both of England, assignors to The Welding Institute, Cambridge, England

Continuation of Ser. No. 537,654, Sep. 30, 1983, abandoned. This application May 31, 1985, Ser. No. 739,764

Claims priority, application United Kingdom, Oct. 6, 1982, 8228521

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—599 **20 Claims**



1. A method of monitoring a structure to which is coupled at least one input transducer and at least one receiving transducer, the method comprising the steps of:

(a) transmitting a non-directional burst of acoustic energy into said structure from said at least one input transducer such that portions of said burst travel along a plurality of different paths through said structure, said paths including a shortest path and a plurality of longer paths;

(b) detecting at said at least one receiving transducer a received wave train resulting from those portions of said burst arriving at said at least one receiving transducer, and

(c) monitoring for any change in said structure after a given time (or event) by repeating said steps (a) and (b) at least once with said coupling of said transducers being essen-

tially unaltered, to detect at least one further received wave train; comparing corresponding portions of said at least one further received wave train with a previously determined at least one reference received wave train; and determining for each said comparison whether a portion of said received wave train differs from a corresponding portion of said reference received wave train, any difference being indicative of the formation or growth of a defect in the overall acoustic path travelled by said acoustic energy.

19. A method of monitoring a structure to which is coupled at least one input transducer and at least one receiving transducer, the method comprising the steps of:

(a) transmitting a non-directional burst of acoustic energy, having an internal frequency of at least 50 kHz, into said structure from said at least one input transducer;

(b) detecting at said at least one receiving transducer a received wave train resulting from those portions of said burst arriving at said at least one receiving transducer, and

(c) monitoring for any change in said structure after a given time (or event) by repeating said steps (a) and (b) at least once with said coupling of said transducers being essentially unaltered, to detect at least one further received wave train; comparing corresponding portions of said at least one further received wave train with a previously determined at least one reference received wave train; and determining for each said comparison whether a portion of said received wave train differs from a corresponding portion of said reference received wave train, any difference being indicative of the formation of growth of a defect in the overall acoustic path travelled by said acoustic energy.

4,603,585

METHOD FOR REPRESENTING ELASTIC PARAMETERS OF OBJECT SURFACES

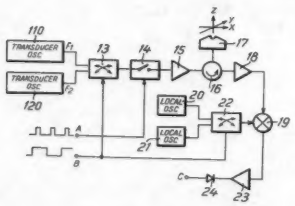
Abdullah Atalar, Ankara, Turkey, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,110

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409929

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—606 **18 Claims**



1. A method of representing elastic parameters of the surface of an object comprising the steps for each point of a predetermined pattern of points on said surface of:

(a) directing a first acoustic beam having a first focus position at said each point;

(b) sensing a first reflection signal;

(c) directing a second acoustic beam having a second focus position different from said first focus position at said each point;

(d) sensing a second reflection signal;

(e) deriving a difference signal having a value indicative of the difference between said first and second reflection signals; and

(f) using said difference signal to represent said elastic parameters at said each point.

4,603,586

DELAY LINE CIRCUIT ARRANGEMENT AND ULTRASONIC IMAGING APPARATUS UTILIZING THE SAME

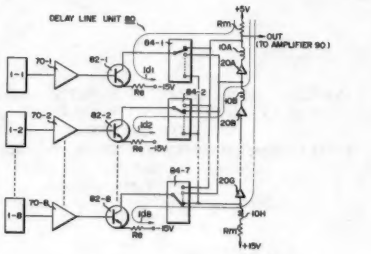
Taketoshi Ilda, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 10, 1985, Ser. No. 690,123

Claims priority, application Japan, Jan. 18, 1984, 59-5535

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—626 **3 Claims**



1. An ultrasonic imaging apparatus having an improved analogue delay line means, said apparatus comprising:

a plurality of ultrasonic transducer elements for converting ultrasonic echoes received thereby into voltage signals;

a plurality of voltage-current converting means respectively connected to said ultrasonic transducer elements, for converting said voltage signals into current signals proportional thereto;

a plurality of switching means, each having a plurality of imput terminals and a single output terminal, for selecting one of said input terminals to be connected with said output terminal, said output terminal being connected to said voltage-current converting means;

analogue delay line means including a plurality of delay lines for delaying said current signals passing therethrough;

a plurality of amplifier means each connected between adjacent delay lines, for compensating for degradation of the amplitudes of said current signals passing through said delay lines;

a plurality of taps derived from said amplifier means to be commonly connected to said input terminals of each of said switching means; and

register means, having one constantly biased end and another end connected to one end of said analogue delay line means and an output, for adding said current signals delayed by said delay lines and producing the resultant signal from said output.

4,603,587

HIGH PRODUCTIVITY VIBRATION TEST FIXTURE SUITED FOR TESTING PRINTED CIRCUIT BOARDS

David V. Kimball, Monrovia, and Charles W. Frost, La Verne, both of Calif., assignors to Kimball Industries, Inc., Monrovia, Calif.

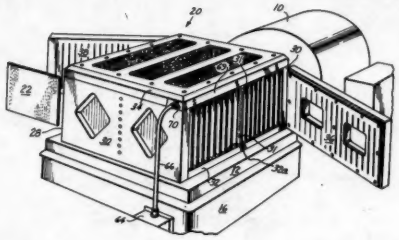
Filed Feb. 19, 1985, Ser. No. 702,949

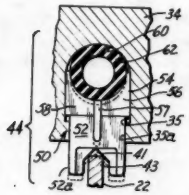
Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—663 **19 Claims**

1. Vibration fixture for high volume, unskilled labor testing of printed circuit boards or any like peripherally narrow workpiece, said fixture comprising a frame having opposing portions and generally congruent with said workpiece and adapted to relatively loosely peripherally support said workpiece in a first assembled relation for ease of mounting or demounting said workpiece to and from the frame, and workpiece shimming structure comprising a shimming body received by said one portion of said frame and inflatable means acting between said one frame portion and said shimming body

whereby said shimming structure is selectively shiftable relative to an opposing portion of said frame for relatively tightly





peripherally supporting said workpiece in a second rigid assembled relation for faithful transmitting of vibration energy to the workpiece in the inflated condition of said inflatable means.

4,603,588

DEVICE FOR GRIPPING SPECIMENS

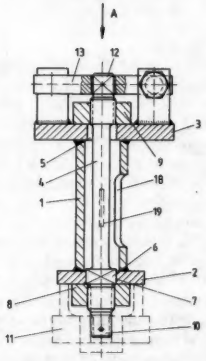
Hans Niermann, Essen; Klaus Köhnen, Mülheim/Ruhr, and Joachim Jorde, Essen, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 633,097

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346429

Int. Cl.[4] G01N *3/00*

U.S. Cl. 73—794 **4 Claims**



1. A device for gripping specimens for applying thereto uniaxial or biaxial condition of stress, comprising an upper plate and a lower plate spaced from each other; a spacer extended between said upper and lower plates and respectively connected to said plates, said spacer accommodating a specimen, said specimen having two opposite end portions extended outwardly from said spacer and projecting through and beyond the respective plate, said end portions each having a thread; two nuts screwed on said end portions so that they are brought into attachment with said plates, respectively, one of said end portions having a threaded pin extended outwardly from the respective nut, another of said end portions having a square end extended outwardly from the respective nut; a pulling device attached to said threaded pin to apply to the specimen a predetermined tensile stress; a wrench mounted on said square end; and two bolts positioned on said upper plate and acting on said wrench to apply a predetermined tensional strain to said specimen, said specimen extending through said upper plate with a play, said lower plate having a square opening, said one of said end portions having a square portion which is received in said square opening, said pulling device being supported immediately against said lower plate by pulling one of the end portions having said threaded pin relative to said lower plate;

said device with a specimen gripped therein being insertable into a laboratory or plant installation under corrosive operational conditions so as to test materials under corrosive operational conditions.

4,603,589

ULTRASONIC FLOWMETER

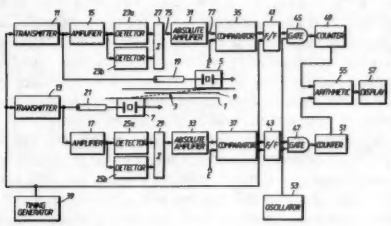
Kaoru Machida, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1984, Ser. No. 686,999

Claims priority, application Japan, Dec. 27, 1983, 58-244472; Dec. 27, 1983, 58-244473

Int. Cl.[4] G01F *1/66*

U.S. Cl. 73—861.28 **5 Claims**



1. An ultrasonic flowmeter, comprising:

means for generating a transmission signal;

ultrasonic transmission means, including a pair of transducers disposed to define therebetween a measuring path through a flowing media, for transmitting an ultrasonic wave across said path and for receiving said ultrasonic wave propagating in said media, said transducers being alternately excited by said transmission signal to transmit said ultrasonic wave;

detector means responsive to a received ultrasonic wave for developing an envelope curve signal indicative of the envelope of said received ultrasonic wave;

means for determining a beginning of said received ultrasonic signal by determining the beginning of said envelope based on said envelope curve signal detected by said detector means; and

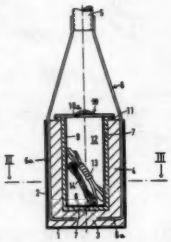
means for developing a signal indicative of the velocity of the flowing media based on a propagation period which is the time interval between exciting of one of said transducers by said transmission signal and the determined beginning of the envelope of the received ultrasonic signal and for developing a signal which is representative of the volume of flow as determined based on said velocity of flow.

4,603,590

METHOD OF AND VESSEL FOR REMOVING SAMPLES FROM A BATH OF MOLTEN METAL

Gotthard Staats, Hemmersdorf, and Horst Thome, Nalbach, both of Fed. Rep. of Germany, assignors to Aktien-Gesellschaft der Dillinger Hüttenwereke, Dillingen, Fed. Rep. of Germany

Continuation of Ser. No. 489,730, Apr. 29, 1983, abandoned.
This application May 29, 1985, Ser. No. 738,776
Claims priority, application Fed. Rep. of Germany, May 4, 1982, 3216554
Int. Cl.[4] G01N *1/12*
U.S. Cl. 73—864.58 18 Claims



1. A method of removing a sample from a killed steel bath having a readily oxidizable constituent, particularly for the purpose of determining the aluminum content of the steel, comprising the steps of immersing a sampling vessel in said bath, said vessel defining a chamber which accommodates an effective amount of a substance having a high affinity for oxygen and a boiling point below the temperature of said bath, and said vessel being provided with a cover having a first portion and a second portion and closing said chamber; eliminating substantially all reactive oxygen from said chamber by destroying said first portion of said cover, introducing an initial part of said sample into said chamber through the opening created by destruction of said first portion, and vaporizing at least part of said substance with said initial part to thereby bind reactive oxygen and/or expel reactive oxygen from said chamber; and admitting the main part of said sample into said chamber subsequent to the eliminating step, the admitting step including destroying said second portion of said cover.

4,603,591

DEVICE RESPONSIVE TO SHOCK FORCES

Richard D. Sibley, Anaheim, and William F. Keller, West Covina, both of Calif., assignors to Koso International, Inc., Santa Fe Springs, Calif.

Filed Nov. 15, 1984, Ser. No. 671,588
Int. Cl.[4] G05G *17/00*; F16K *17/36*
U.S. Cl. 74—2 19 Claims

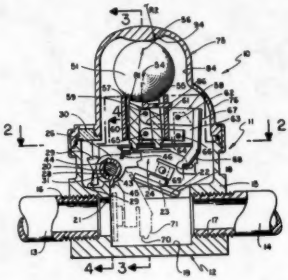
1. A shock responsive device comprising:

a support structure;

a weight adapted to be supported in a predetermined position by said structure and which is displaceable laterally from said position by shock forces;

mechanism for actuating a controlled unit in response to said shock induced lateral displacement of the weight, including an element adapted, upon said lateral displacement of the weight, to be engaged by the weight and moved by the weight in a diredtion to actuate said unit; and

releasable holding means operable by said weight to retain said element against movement in said direction while the weight remains in said predetermined position but adapted to be automatically released by the weight to permit said movement of said element for actuation of the controlled



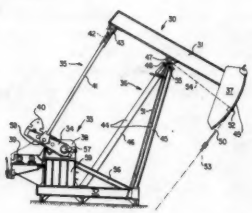
unit upon said lateral displacement of the weight from said predetermined position thereof.

4,603,592

OFF-VERTICAL PUMPING UNIT

Quentin R. Siebold, and Walter Labuhn, both of Calgary, Canada, assignors to Legrand Industries Ltd., Calgary, Canada

Filed Oct. 14, 1983, Ser. No. 542,109
Claims priority, application Canada, Jul. 28, 1983, 433460
Int. Cl.[4] F16H *21/32*
U.S. Cl. 74—41 20 Claims



1. A pumping unit of a walking beam type of class I geometry, having a source of rotary motive power, a crank driven by the source of rotary motive power, a pitman pivotally connected at one end to the crank and pivotally connected at an opposite end to one end of a beam, a beam support for pivotally supporting the beam at a fulcrum, and a horsehead at an opposite end of the beam, said horsehead having a convex arcuate surface for supporting a wire rope sling connectable to a remote pump by means of a polish rod, said pumping unit being arranged to permit relatively efficient pumping of a well having a central axis inclined at an angle to geological vertical in a range from 10° to about 45° in that:

(a) the beam support configuration, the beam support location and angle of inclination to the vertical of a longitudinal axis of the beam support are selected to maintain resultant forces exerted by the beam on the beam support as substantially compressive forces;

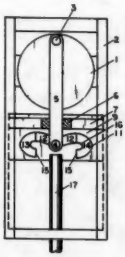
(b) size, configuration and position of the horsehead are selected to avoid excessive wire rope sling wear and excessive lateral movement of the polish rod; and

(c) the position of the fulcrum and length of the beam are selected so that the beam support does not intersect nor interfere with a wellhead.

4,603,593
SYNCHRONIZED SCOTCH YOKE

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Feb. 19, 1985, Ser. No. 702,712
Int. Cl.[4] F16H *21/18, 21/22*
U.S. Cl. 74—50 1 Claim



1. A synchronized scotch yoke comprising in general two opposed front and rear cam blocks having two opposed curved recessed cam tracks which engage opposite ends of a reciprocating cam pin and convert the irregular reciprocating linear motion of the cam pin to uniform reciprocating linear motion of the cam blocks, and comprising in particular;

a flywheel (1) mounted in a vertical plane on a shaft occupying a horizontal axis,

a crank pin (3) mounted in the peripheral area of a face of said flywheel,

a connecting rod (5) occupying a vertical axis adjacent to said face of said flywheel, said connecting rod having an upper end, a lower end, and a medial section, said upper end engaging said crank pin,

a cam pin (4) occupying a horizontal axis, said cam pin having a front end, a rear end, and a center, said center engaging said lower end of said connecting rod,

a front cam block (8) having a transverse slot (7) in an upper inside face thereof and having a curved recessed front cam track (10) in a lower inside face thereof,

a rear cam block (9) having a transverse slot (7) in an upper inside face thereof and having a curved recessed rear cam track (11) in the lower inside face thereof,

a horizontal traveler block (6) mounted in said transverse slots, said traveler block having a hole slidably engaging said medial section of said connecting rod,

said front cam track having a flat central section (12), a curved inclined ramp (13) to the left of said central section and a curved inclined ramp (14) to the right of said central section,

said rear cam track having a flat central section (12), a curved inclined ramp (13) to the left of said central section and a curved inclined ramp (14) to the right of said central section,

said curved inclined ramp (13, 14) having terminating lines (15) comprising the extremities of said curved inclined ramps,

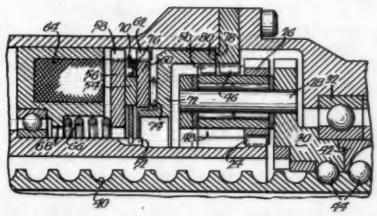
said front cam block and said rear cam block being mounted with said inside faces in contact so that said front cam track and said rear cam track form an enclosed cam track,

said cam pin being mounted inside said enclosed cam track, with said front end of said cam pin traveling in said front cam track and said rear end of said cam pin travelling in said rear cam track.

4,603,594
FAIL SAFE ACTUATOR

Duane H. Grimm, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 31, 1984, Ser. No. 615,772
Int. Cl.[4] F16H *25/22, 57/10*
U.S. Cl. 74—89.15 14 Claims



7. An actuator comprising:

a motor having a rotary output;

an actuating element mounted for movement through a path;

a gear reduction mechanism, including a rotary element, interconnecting said output and said arm element and operable to move said arm element through said path;

a friction brake element rotatable in response to rotation of said output;

first and second brake reaction elements mounted for independent movement into and out of engagement with said friction brake element and held against rotation;

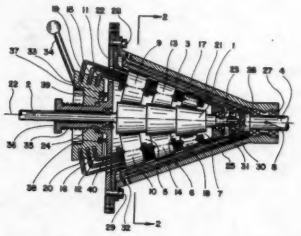
selectively operable control means for moving said first reaction element into or out of engagement with said friction brake element; and

means including a cam associated with said rotary element, for moving said second reaction element into and out of engagement with said friction brake element at at least one predetermined position of said actuating element along said path.

4,603,595
COMMON APEX DOUBLE CONE VARIABLE SPEED MECHANICAL TRANSMISSION

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Michael Stranahan, P.O. Box 15, Woody Creek, Colo. 81656

Filed Nov. 23, 1984, Ser. No. 674,501
Int. Cl.[4] F16H *15/16, 15/00, 15/56*
U.S. Cl. 74—191 9 Claims



1. A mechanical transmission device for transmitting power from a first shaft to a second shaft and vice versa comprising in combination:

(a) a first hollow rotating member including an internal conical surface coaxially disposed with respect to said first shaft wherein extension of said internal conical surface converges to a single apex point, said first hollow rotating member nonrotatably coupled to said first shaft;

(b) a second rotating member including a plurality of external conical surfaces disposed in series and coaxially with respect to said second shaft wherein extensions of said plurality of external conical surfaces converge to said single apex point, said second rotating member nonrotatably coupled to said second shaft and rotatably disposed within said internal conical surface included in said first hollow rotating member in a coaxial relationship, wherein a series of conical frustum shell surfaces are provided intermediate said internal conical surface of said first hollow rotating member and said plurality of external conical surfaces of said second rotating member;

(c) a plurality of sets of conical frustum rollers rotatably and nonorbitably disposed within plurality of said conical frustum shell spaces, each set of said conical frustum rollers disposed in each conical frustum shell space of said plurality of conical frustum shell spaces frictionally coupling rotating movements of said first hollow rotating member and said second rotating member when said conical frustum rollers are simultaneously in contact with said internal conical surface of said first hollow rotating member and one of said external conical surfaces of said second rotating member; and

(d) means for selectively establishing a simultaneous frictional contact between one set of said conical frustum rollers and said internal conical surface of said first hollow rotating member and one of said external conical surfaces of said second rotating member;

whereby, rotational motions of said first and second shafts are coupled to one another at various transmission ratios depending on different set of said conical frustum rollers selectively establishing frictional coupling of rotating movements of said first hollow rotating member and said second rotating member.

4,603,596

ACTUATION SYSTEM FOR TRANSMISSION SYNCHRONIZER PROVIDING REGULATED ENGAGEMENT PRESSURE

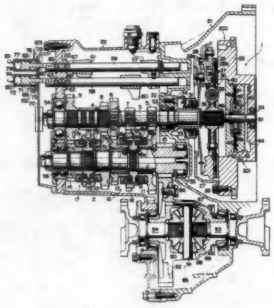
Teruo Akashi; Hiroshi Ito, and Shigemichi Yamada, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 8, 1983, Ser. No. 473,218

Claims priority, application Japan, Apr. 23, 1982, 57-68409

Int. Cl.⁴ F16H *5/40, 3/08;* **B60K** *41/02;* **F16D** *21/04*

U.S. Cl. 74—336 R **5 Claims**



1. In a transmission for a vehicle, comprising a rotary power input member, a rotary power output member, and a synchronizer for selectively torque-transmittingly connecting said power input member to said power output member, said synchronizer comprising a first rotary member rotatably around an axis and constantly torque-transmittingly connected with said power input member, a second rotary member rotatably around said axis and constantly torque-transmittingly connected with said power output member, a synchronizer sleeve rotatable around said axis and constantly torque-transmittingly connected with one of said first and second rotary members, said synchronizer sleeve being axially movable relative to said one rotary member so far as torque-transmittingly to mesh with the other of said first and second rotary members, and a synchronizer ring rotatable around said axis and torque-transmittingly connected with said one rotary member when said synchronizer sleeve is axially moved toward said other of said first and second rotary members, said synchronizer ring being frictionally engagable with said other rotary member so as to make rotations of said first and second rotary members approach to one another toward synchronization therebetween when frictionally pressed against said other rotary member, an actuation system, comprising:

(a) an actuator which selectively drives said synchronizer sleeve and synchronizer ring together toward and away from said other rotary member so as, when said synchronizer sleeve and synchronizer ring are driven toward said other rotary member, first to engage said synchronizer ring frictionally with said other rotary member and then to engage said synchronizer sleeve as torque-transmittingly meshed with said other rotary member; and

(b) a control system which controls operation of said actuator so as, when said synchronizer sleeve and synchronizer ring are driven toward said other rotary member, to vary the force of frictionally pressing said synchronizer ring against said other rotary member in relation to the difference of rotational speed between said first and second rotary members so that said force of frictional pressing is substantially lower when said difference of rotational speed substantially exists than a final value after said difference of rotational speed has substantially disappeared, wherein said force of frictional pressing is aburptly and substantially increased up to said final value at the time when said difference of rotational speed is reduced substantially to zero.

4,603,597

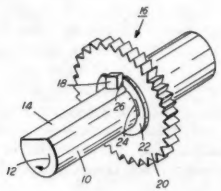
DRIVE SYSTEM

Frank V. Onorati, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1985, Ser. No. 696,561

Int. Cl.⁴ F16H *55/17;* **F16B** *7/00, 21/00;* **F16D** *1/00*

U.S. Cl. 74—434 **10 Claims**



1. A drive system, including:

a shaft member;

a unitary driven member adapted to be mounted on said shaft member to rotate in unison therewith, said driven member having a protrusion extending outwardly from one surface thereof; and

an annular split retaining ring having opposed free ends defined by the split in the ring, said retaining ring mounted removably on said shaft member with the free ends thereof meshing with the protrusion extending outwardly from said driven member so as to rotate in unison therewith.

4,603,598

SHIFT LEVER

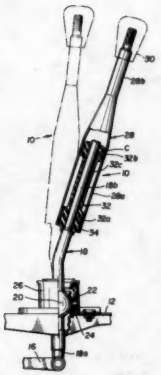
Shinsaku Tsuji, Ebina; Toshimitsu Kimura, Yokohama; Yasushi Asano, and Yasuhito Suzuki, both of Honjo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Fuji Koko Co., Ltd., Tokyo, both of, Japan

Filed Oct. 5, 1984, Ser. No. 658,233

Claims priority, application Japan, Oct. 13, 1983, 58-189816

Int. Cl.[4] G05G *7/16, 9/12*

U.S. Cl. 74—473 P **10 Claims**



1. A shift lever comprising:

a first lever section having an elongate end portion which is substantially rigid;

a second lever section having an elongate hollow cylindrical portion in which said first lever section end portion is disposed;

first and second elastomeric insulators securely mounted on said first lever section end portion and spaced apart from each other in an axial direction of said first lever end portion;

means for securely connecting said first elastomeric insulator with said second lever section cylindrical portion; and

means forming a clearance between said second elastomeric insulator and said second lever section cylindrical portion.

4,603,599

STEERING SYSTEM EQUIPPED WITH STEERING WHEEL CENTER PAD ANTI-ROTATION MECHANISM

Hideoki Matsuoka, Isehara, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed May 24, 1985, Ser. No. 737,443

Claims priority, application Japan, May 28, 1984, 59-107994

Int. Cl.[4] B62D *1/10*

U.S. Cl. 74—492 **3 Claims**

1. A steering system comprising:

a stationary column having an upper end portion;

a steering shaft surrounded by said column and having an upper end portion projecting from the upper end of said column;

a steering wheel having a hub portion at which it is mounted on the upper end portion of said steering shaft for rotation therewith;

said hub portion having an annular flange section and a pair of coaxial upper and lower sleeve sections projecting upwardly and downwardly from the inner periphery of said flange section;

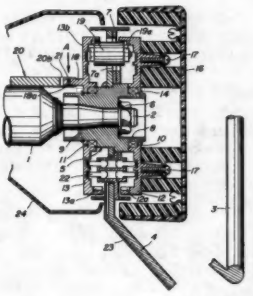
a pair of upper and lower internal gears rotatably mounted on said upper and lower sleeve sections, respectively;

a pinion rotatably mounted on said hub portion and meashed with said upper and lower internal gears;

an anchor leg provided to the lower end of said lower internal gear;

a location arm provided to the upper end of said column;

one of said anchor leg and said location arm having an attaching end formed with a pair of opposed lateral sides which are opposed in the direction perpendicular to the diametrical direction of said lower internal gear;



the other of said anchor leg and said location arm having a bifurcated end loosely receiving therewithin said attaching end; and

fastening means for resiliently deforming said bifurcated end and bringing the same into contact with said opposed lateral sides of said attaching end.

4,603,600

PARKING BRAKE OPERATING DEVICE

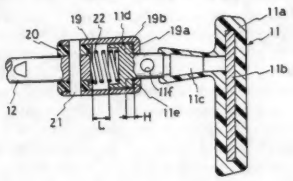
Takeo Yamazaki, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Jan. 16, 1985, Ser. No. 691,770

Claims priority, application Japan, Feb. 17, 1984, 59-21857[U]

Int. Cl.[4] G05G *5/06*

U.S. Cl. 74—503 **11 Claims**



1. A parking brake operating device comprising: a plunger mounted on a car body such as to be slidable in the axial direction thereof and rotatable around the axis thereof; a handle attached to one end of said plunger such as to be slidable in the axial direction of said plunger and rotatable around the axis of said plunger; a parking brake actuating cable which is connected to the other end of said plunger such that a parking brake will be actuated when a driver pulls said plunger in the act of pulling said handle; a locking mechanism which inhibits said plunger from returning due to a reaction force of said brake when said plunger is pulled by said driver and which releases said inhibition by a rotation of said plunger; a ring cam surface facing in the direction opposite to the handle pulling force provided on said plunger; a ring cam surface corresponding to said cam surface provided on said handle; a spring for retaining said handle at a predetermined angular position in relation to said plunger by pressing said cam surfaces, thereby to connect said handle with said plunger for unitary rotation only when said handle is pulled; a sleeve coaxially fixed on said

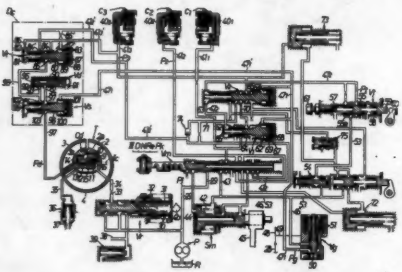
one end of plunger; and a shaft member provided on said handle for inserting into said sleeve so as to be supported; said cam surfaces being provided on an expanded portion at the end of said shaft member and at the opposite position of the end surface on the handle side of said sleeve and said spring being disposed in said sleeve.

4,603,601

DIRECT-COUPLING CONTROLLER FOR A TRANSMISSION HAVING DELAY MEANS FOR TEMPORARILY RELEASING THE CLUTCH DURING SPEED CHANGE

Masao Nishikawa, Tokyo; Shinzo Sakai, Saitama; Yoichi Sato, Wako, and Yukihiro Fukuda, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 641,126
Int. Cl.[4] F16H *47/00*; B60K *41/02*
U.S. Cl. 74—731 **6 Claims**



1. A direct-coupling controller for a torque converter in a vehicular automatic transmission, the torque converter including an input member provided with a pump rotor and an output member provided with a turbine rotor; the transmission further including a direct-coupling clutch interposed between the input and output members for mechanically coupling them together, the clutch including a hydraulic cylinder for actuation thereof, and an auxiliary transmission including a plurality of stages of gear trains for transmitting the torque of the output member to a drive wheel, each of the gear trains having a hydraulically operated friction element for actuation thereof, each friction element including a hydraulic cylinder;

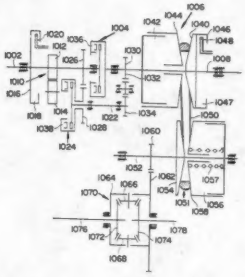
said direct-coupling controller comprising a timing valve interconnecting the hydraulic cylinder of the direct-coupling clutch and the hydraulic cylinder of at least two of the friction elements that are of adjacent operational order; said timing valve having and being movable between a first switching position in which working oil pressure of the hydraulic cylinder of one of the friction elements is supplied to the hydraulic cylinder of the direct-coupling clutch, and a second switching position in which working oil pressure of the hydraulic cylinder of the other of the friction elements is supplied to the hydraulic cylinder of the direct-coupling clutch; said timing valve including a first pilot oil pressure chamber to which is applied oil pressure to move said timing valve to said first switching position and a second pilot oil pressure chamber to which is applied oil pressure to move said timing valve to said second switching position; said first pilot oil pressure chamber being connected to the hydraulic cylinder of said one of the friction elements and the second pilot oil pressure chamber being connected to the hydraulic cylinder of said other of the friction elements, said timing valve including delay means for delaying movement between switching positions for a predetermined period of time after working oil pressure has been applied to said friction elements.

4,603,602

METHOD OF CONTROLLING CONTINUOUSLY VARIABLE TRANSMISSION

Yoshikazu Tanaka; Haruyoshi Kumura, both of Yokohama; Keiju Abo; Hiroyuki Hirano, both of Yokosuka, and Sigeaki Yamamuro, Zushi, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 13, 1983, Ser. No. 560,940
Claims priority, application Japan, Dec. 17, 1982, 57-220089
Int. Cl.[4] B60K *41/12, 41/18*
U.S. Cl. 74—866 **7 Claims**



1. A method of controlling change in reduction ratio in a continuously variable transmission of a motor vehicle, wherein the rate of change in reduction ratio in the continuously variable transmission with respect to time is adjustable by a shift actuator in response to a speed at which the shift actuator operates, the method comprising the steps of:

detecting operating conditions of the motor vehicle;

determining a desired optimum reduction ratio indicative signal indicative of a target operating position of the shift actuator which corresponds to a desired optimum reduction ratio for the detected operating conditions of the motor vehicle;

generating an actual reduction ratio indicative signal indicative of an actual operating position of the shift actuator;

comparing said actual signal with said desired signal and generating a first signal when an upshift is required and a second signal when a downshift is required;

causing the shift actuator to operate at a first predetermined speed in a first direction in response to the presence of said first signal; and

causing the shift actuator to operate at a second predetermined speed in a second direction which is opposite to the first direction in response to the presence of said second signal;

said first predetermined speed being slower than said second predetermined speed.

4,603,603

ELECTRONIC TRANSMISSION SHIFT CONTROLLER HAVING A CONTROLLED ALIGNMENT VALVE MECHANISM

Michael E. Salmon, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

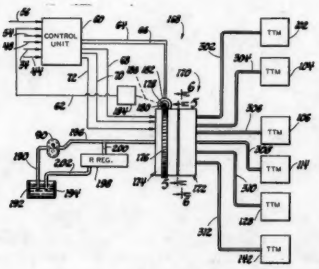
Filed Aug. 26, 1983, Ser. No. 526,657
Int. Cl.[4] B60K *41/22*
U.S. Cl. 74—868 **1 Claim**

1. In a motor vehicle multigear ratio transmission having a line pressure fluid source and a plurality of fluid operated drive establishing mechanisms selectively actuated according to a predetermined schedule to effect gear ratio shifting, apparatus comprising;

fluid supply means intermittently actuable to connect the line pressure source to a fluid supply passage to thereby affect the fluid pressure therein;

fluid exhaust means intermittently actuable to exhaust fluid from a fluid exhaust passage to thereby affect the fluid pressure therein;

fluid directing means for selectively actuating the drive establishing mechanisms to effect gear ratio shifting by selectively connecting the fluid supply and exhaust passages to the drive establishing mechanisms according to the predetermined schedule, such means including first and second relatively movable members, the first member having a plurality of fluid conducting passages connected to respective drive establishing mechanisms, and the second member having a pair of controlled pressure passages and adjacently disposed line pressure passages adapted to be moved into alignment with respective fluid conducting passages of the first member, the line pressure passages being connected to said fluid pressure source, and valve means connecting said fluid supply and exhaust passages to said pair of controlled pressure passages, said valve means being switchable between first and second positions for interchanging said fluid supply and exhaust passages with said pair of controlled pressure passages, the controlled pressure passages of said second member being located relative to the fluid conducting passages of said first member such that relative movement of said first and second members in one direction while said valve means is moved to the first position operates to successively connect such controlled pressure passages and adjacently



disposed line pressure passages with respective fluid conducting passages of said first member for upshifting said transmission, and relative movement of said first and second member in the opposite direction while said valve means is switched to the second position operates to successively connect such controlled pressure passages and such adjacently disposed line pressure passages with respective fluid conducting passages of said first member for downshifting said transmission, each such upshift and downshift including a transient phase in which the fluid conducting passage of the first member associated with the respective drive establishing mechanism is connected to one of the controlled pressure passages of the second member to thereby permit fluid pressure to be supplied to or exhausted from such drive establishing mechanisms, and a steady state phase in which such fluid conducting passage is isolated or connected to a line pressure passage of the second member so as to maintain the actuation of the drive establishing mechanism brought about in the transient phase; and

shifting means effective when it is desired to shift transmission gear ratios to switch said valve means to the first position and to produce relative movement of said first and second members in said one direction if the desired shift is an upshift, and to switch the valve means to said second position and to produce relative movement of said first and second members in said opposite direction if the desired shift is a downshift.

4,603,604

CREEP-INHIBITING DEVICE FOR AN AUTOMOTIVE VEHICLE EQUIPPED WITH AN AUTOMATIC TRANSMISSION

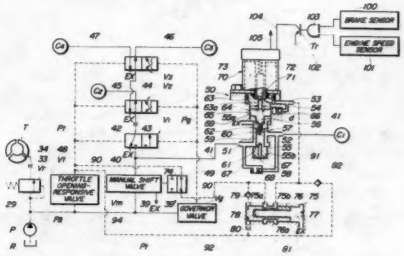
Masao Nishikawa, Tokyo; Yoichi Sato, Wako, and Yukihiro Fukuda, Asaka, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Feb. 5, 1985, Ser. No. 698,401

Claims priority, application Japan, Feb. 9, 1984, 59-22269; Mar. 16, 1984, 59-50345

Int. Cl.[4] F16H *47/00*

U.S. Cl. 74—869 **7 Claims**



1. In a creep-inhibiting device for use in an automotive vehicle equipped with an engine, a fluid coupling, a transmission mechanism coupled in series to said fluid coupling and having a frictionally engaging element, and an operating fluid source for supplying an operating fluid to said frictionally engaging element, said device including engine load sensor means for producing a signal fluid having a pressure representative of load applied on said engine, control means interposed between said frictionally engaging element and said operating fluid source, and a fluid line for delivering said signal fluid from said engine load sensor means to said control means, wherein said control means is adapted to control the power transmission capacity of said frictionally engaging element within a range from substantially zero to a predetermined value in dependence on the pressure of said signal fluid supplied thereto, to inhibit creeping of said vehicle when said engine is in a no-load state, the improvement comprising selector valve means arranged in said fluid line, said selector valve means being adapted to assume a first position wherein it allows said signal fluid to flow in both directions from said engine load sensor means to said control means and vice versa when the pressure of said signal fluid is lower than a predetermined value, and to assume a second position wherein it allows said signal fluid to flow in a sole direction from said engine load sensor means to said control means when the pressure of said signal fluid is higher than said predetermined value.

4,603,605

THREAD VISE

Richard E. Miller, 17301 66th Ct., Tinley Park, Ill. 60477

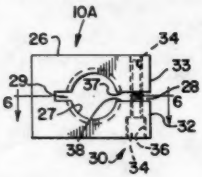
Continuation of Ser. No. 547,627, Nov. 1, 1983, abandoned. This application Jun. 4, 1985, Ser. No. 741,034

Int. Cl.[4] B25B *13/50*

U.S. Cl. 81—53.2 **7 Claims**

1. A wrench receiving thread cleaning and gripping device adapted to be threaded on and advanced the full exposed length of an externally threaded stud to clean the stud threads and to position the nut at a desired level of the stud which comprises a one piece radially split nut having opposed external sides adapted to receive the jaws of a wrench in non-rotating relation and an internally threaded open ended bore therethrough having threads mating with the threads of the stud to be cleaned and gripped, the split ends of said nut being spaced apart to define a gap therebetween, an internal longitudinal groove through said bore diametrically opposite the gap pro-

viding a reduced thickness bending zone accommodating contraction of the nut around the stud to lock the mating threads of the nut and stud against relatiye rotation, and means for reducing the gap between the split ends of the nut and bending



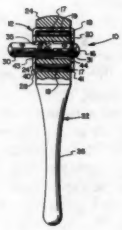
the reduced thickness bending zone to contract the bore of the nut forcing the internal threads into firm mated locked engagement with the threads of the stud without damaging the stud threads when wrench torque is applied to the nut in either clockwise or counterclockwise directions.

4,603,606

UNIDIRECTIONAL DRIVE TOOL CARTRIDGE AND METHOD OF MANUFACTURE

James Headen, Lewisville, Tex., assignor to Radian Tool Corporation, Lewisville, Tex.

Filed Jul. 9, 1984, Ser. No. 629,083
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—59.1 **3 Claims**



1. A unidirectional drive cartridge adapted for securement to a force application member for directional torque transmission, comprising:

a housing including first and second thin walled cup members adapted for matingly engaging one another;

a unidirectional clutch mounted within said two-cup housing, said clutch having a central opening extending therethrough;

a torque transmitting drive shaft disposed within said clutch and having front and back portions for extending outwardly of said clutch and a central shoulder portion for containment therein;

means for slidably receiving said drive shaft within said central opening of said clutch to enable selective, slidable, longitudinal positioning of said drive shaft within said receiving means and rotational engagement of said drive shaft by said receiving means;

said drive shaft receiving means being located within said clutch to freely rotate in a first direction and to be constrained by said clutch against rotation in a second opposite direction;

said housing further including front and back faces, each having a central aperture within which said front and back drive shaft portions are located and of a size to engage said shoulder portion of said drive shaft against said faces to constrain it within said receiving means;

said drive shaft being longitudinally located within said housing wherein a torque applied to said housing will be transmitted only in one direction by said drive shaft, and when said drive shaft is longitudinally located in the direction of an opposite face, a torque applied to said housing being transmitted only in an opposite direction;

said drive shaft being of a generally square cross-sectional configuration;

said drive shaft being adapted to receive a socket mounted thereon in secured engagement therewith for the transmission of torque therethrough; and

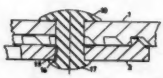
said drive shaft further including socket retainer elements on said front and back portions thereof.

4,603,607

PIVOT CONNECTION FOR SLIP JOINT PLIERS

Bernard P. Schaffner, Jr., Meadville, Pa., assignor to Channellock, Inc., Meadville, Pa.

Filed Feb. 25, 1982, Ser. No. 352,338
Int. Cl.[4] B25B *7/04*
U.S. Cl. 81—414 **5 Claims**



1. An improved high strength slip joint pliers comprising:

first and second members each having a handle portion connected to shanks extending from mating jaws;

the shank of the jaw of said first member having a slot with a plurality of pivot positions along its length defined by grooves;

said shank of the second member having a circular hole with a cylindrical section on one side surface thereof adjacent said shank of the first member with a circular tapered part facing outwardly from said cylindrical section to an opposite side surface of said shank of the second member, with an angle of taper of said tapered part being a locking taper; and a rib like tongue extending outwardly from said one side surface of said shank of said second member and being adapted to be positioned in any selected one of said pivot positions for adjusting the opening between said mating jaws; and a permanently set, sliding pivot type fastener connection between the shanks of said mating jaws embodying a rivet with a head and shank;

said head overlapping said slot and a portion of the shank extending through the slot and slidable back and forth along the slot;

the remaining portion of said shank extending through the cylindrical section of said circular hole and through said circular tapered part and projecting beyond the shank of said second member; the end of said remaining portion which projects beyond said shank of the second member being headed over the second member forming in one step a round overlapping head like said rivet head and expanded tightly into said circular tapered part and at the same time being expanded into tight engagement around the intersection of said circular tapered part with the outer surface of said second member underlying said overlap-

ping head and further expanded into tight engagement with said cylindrical section of said circular hole and thereby forming a united, permanently set, non-rotatable joint of the shank of said rivet with the shank of said second member, and sliding pivot fastener connection with a spaced clearance of predetermined size between the head of said rivet and said side surface from which said rib extends, thereby enabling said shank of said rivet to be freely slidable back and forth along said slot when said handles of said pliers are rotated to a position in which said rib like tongue and said grooves are disengaged.

4,603,608

REMOTELY-MANIPULATED APPARATUS FOR PERFORMING MAINTENANCE WORK IN SHIELDED CELLS

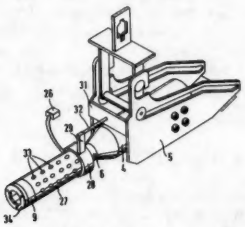
Günther Dudek, Visselhövede, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Sep. 20, 1984, Ser. No. 652,765

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334580

Int. Cl.[4] B25B *19/00*

U.S. Cl. 81—463 **9 Claims**



1. An apparatus for the remotely-manipulated connection and disconnection of threaded fasteners of a flange joint in a radioactively-ladened cell, the apparatus comprising:

a remotely-controlled wrench including a drive shaft and a holder for engaging the fastener to be connected or disconnected;

an extension shaft disposed between said drive shaft and said holder for connecting said holder to said drive shaft for rotation therewith; and,

energizable magnetic means mounted on said extension shaft for developing a magnetic force for holding the fastener in said holder as the same is disconnected and drawn from a flange of the flange joint.

4,603,609

APPARATUS FOR CUTTING A SHEET-LIKE MEMBER APPLIED TO A SURFACE OF A SEMICONDUCTOR WAFER

Ono Takatoshi, Nagareyama, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,691

Claims priority, application Japan, Oct. 21, 1983, 58-197359; Apr. 27, 1984, 59-86557

Int. Cl.[4] B23B *37/00*

U.S. Cl. 82—51 **4 Claims**

1. An apparatus for melting and cutting a sheet-like member applied to a surface of a semiconductor wafer at the edges of said semiconductor wafer, comprising:

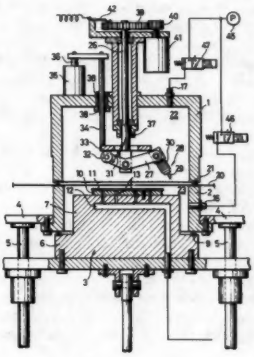
a base, said base including a support for said semiconductor wafer;

support means for said heating rod;

means for heating said heating rod;

means for urging said heating rod relatively against said edges of said semiconductor wafer attached to said means for said rod support means; and

a moving mechanism attached to the end of said support means relatively moving said heating rod along said edges of said semconductor wafer;



whereby said heating rod is relatively moved along said edges of said semiconductor wafer as the former is relatively urged against the latter so that said sheet-like member applied to said semiconductor wafer is melted and cut at said edges of said semiconductor wafer.

4,603,610

SIZING APPARATUS

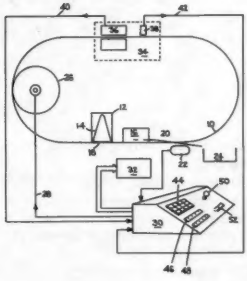
John A. Whitehouse, 8 Old Rectory Close, Mulbarton, Norwich, England

Filed Nov. 15, 1984, Ser. No. 671,516

Claims priority, application United Kingdom, Nov. 15, 1983, 8330422

Int. Cl.[4] B26D *7/30*

U.S. Cl. 83—13 **11 Claims**



9. A method of controlling the cutting or sawing of a product into uniformly sized portions comprising the steps of:

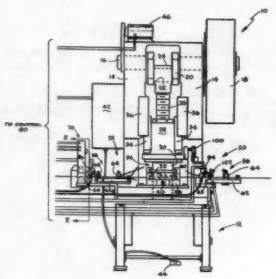
(1) resetting apparatus for accumulating an area signal, to zero;

(2) entering a target weight for each piece to be cut and an assumed density value of the product into a computing means;

(3) moving the face of the product from which slices are to be cut around a closed loop track and past a detection station so that the height of the end face can be sampled at regular intervals and an area signal accumulated corresponding to a summation of all the individual height signals;

(4) multiplying the area signal by a Constant to give the area of the end face of the product, the Constant being proportional to the spacing between the sampling points;
(5) multiplying the area signal by the density value signal to give the weight of a slide of the product of unit thickness;
(6) dividing the numerical target weight value by the unit thickness weight value to obtain a numerical value of the thickness of the cut required to obtain the desired target weight;
(7) generating a control signal proportional to the numerical value of the thickness required;
(8) adjusting a cutting means to remove from the measured end face of the material a slide having the desired thickness;
(9) cutting a slice from the said end face of the product having the desired thickness;
(10) weighing the slice of product to obtain the average weight of the cut pieces;
(11) comparing the average weight with the target weight and producing from the comparison a feedback signal indicating whether the density parameter utilized in the computation of the thickness was correct, and
(12) where a correction in the density value is required, updating the density value in the computing means and restoring the same for use in subsequent depth-of-cut computations.

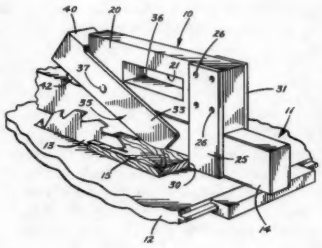
4,603,611
FEED SYSTEM FOR PUNCH PRESS
Dennis R. Ferguson, P.O. Box 767, Willoughby, Ohio 44094
Filed Jul. 6, 1984, Ser. No. 628,393
Int. Cl.[4] B21D *28/02*
U.S. Cl. 83—50 **12 Claims**



8. A method for delivering stock to a punch press, comprising the steps of:
pushing a piece of stock toward the press;
performing punching operations upon the stock after the stock has been delivered to the press;
counting the number of operations performed upon the stock;
comparing the counted number of operations with a first predetermined number; and
pulling the stock away from the press after the number of operations matches the predetermined number.

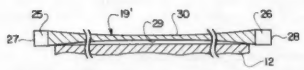
4,603,612
SAFETY ATTACHMENT FOR A TABLE SAW
Richard R. Atkins, 730 N. Lyford Rd., Rockford, Ill. 61107
Filed Dec. 17, 1984, Ser. No. 682,085
Int. Cl.[4] B27B *25/10*
U.S. Cl. 83—425 **9 Claims**

1. An attachment for a table saw having a horizontal table, a blade rotational in a vertical plane and extending upwardly from the table, and a rip rail upstanding from the table and spaced laterally from the blade to guide a piece of stock into and past the blade as the stock is cut by the blade, said attachment comprising a body captivated laterally on the rip rail and adapted to be moved from the front of the rail toward the rear thereof during an active pushing stroke, a leg fixed rigidly to and depending from the trailing end portion of said body and located at a lateral position between said rail and said blade, the leading side of said leg engaging the trailing end of said stock and pushing said stock into said blade during said pushing



stroke, an arm formed separately of said leg and pivotally connected to said body to swing upwardly and downwardly independently of said leg, and means for biasing said arm downwardly to cause the lower end of said arm to press downwardly against the upper side of said stock and to hold said stock downwardly on said table as said stock is pushed into and past said blade by said leg.

4,603,613
HOLLOW FORMED BAND SAW FOR INDUSTRIAL BAND MILL
Harry Wilson, Rte. #5, Box 111, Selinsgrove, Pa. 17870
Continuation-in-part of Ser. No. 535,296, Sep. 23, 1983, abandoned. This application May 23, 1985, Ser. No. 737,090
Int. Cl.[4] B27B *33/06*
U.S. Cl. 83—661 **6 Claims**



1. In an industrial band mill, wherein a driven band saw is mounted on a plurality of wheels, each of which is substantially flat and has a front edge, and at least one of which may constitute a driving wheel, wherein the band saw has inner and outer sides and further has a pair of edges, at least one of which has cutting teeth formed thereon, wherein the edge with the cutting teeth overhangs the respective front edges of the wheels, and wherein means are provided for moving the wheels in a direction substantially away from one another, the improvement wherein the band saw is substantially free of pre-stress in its manufacture prior to use, the band saw being concavely formed on at least its inner side and substantially from edge to edge thereof, wherein the band saw has a cross-sectional thickness which is substantially non-uniform throughout and which decreases substantially uniformly from edge to edge towards the approximate center of the band saw, such that there is reduced mass at the center of the band saw between the edges thereof, wherein a non-uniform radial gap exists between the band saw and each of the wheels when the band saw is first mounted on the wheels, and wherein when the wheels are moved away from one another, the band saw will be stretched and the inner surface of the band saw will become substantially flush against the respective wheels in the operative position of the band saw on the band mill, thereby eliminating the necessity for stressing the band saw by roll tension-

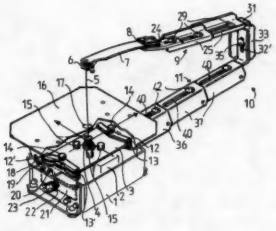
ing or the like during the manufacture thereof; and whereby the reduction of mass replaces the expansion otherwise required by roll tensioning.

4,603,614

ELECTROMAGNETIC JIGSAW

Marcel Charonnat, 34 rue Sambre et Meuse, 75010 Paris, France

Filed May 22, 1984, Ser. No. 612,843
Claims priority, application France, May 25, 1983, 83 08616
Int. Cl.[4] B27B *19/04*
U.S. Cl. 83—752 **9 Claims**



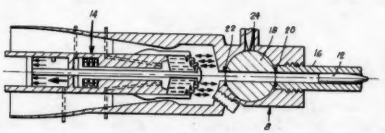
1. An electro-magnetic jig-saw, comprising:
a blade having an upper end and a lower end;
a plate vibrated by an electro-magnet supplied with AC current, the plate having two pairs of opposite edges and the plate being spaced, at rest, from the electro-magnet;
fastening means securing said lower end of the blade to the plate;
at least one inertia mass formed by a weight affixed to the plate; and,
means for varying the spacing between the vibrating plate and the electro-magnet, acting only on a portion of the plate adjacent to said edges.

4,603,615

LIQUID PROPELLANT WEAPON SYSTEM

Eugene Ashley, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Jan. 8, 1979, Ser. No. 2,038
Int. Cl.[4] F41F *15/00*; F16K *15/14*
U.S. Cl. 89—7 **10 Claims**



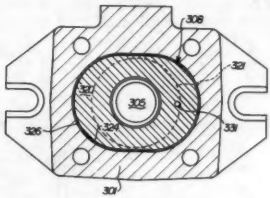
10. A liquid propellant gun having an annular piston disposed between a pumping chamber and a combustion chamber and having a first longitudinal axis comprising:
said annular piston including a valve assembly comprising:
a plurality of transversely overlapping elements disposed in a nested array to define a piston end wall having a pumping chamber face and a combustion chamber face, including:
an outer ring and
a central control rod,
each of said elements having a respective longitudinal axis in common with said first longitudinal axis,
first means biasing said rod to displace said psiton end wall to minimize the volume of said pumping chamber,
second means for applying fluid pressure to said pumping chamber face of said piston end wall and adapted to overcome the bias of said face means to enlarge the volume of said pumping chamber,
third means for applying fluid pressure to said combustion chamber face of said piston end wall and adapted to overcome the pressure of said second means to decrease the volume of said pumping chamber, and
having a mode of operation such
that when said second means applies pressure to said pumping chamber face, said ring and said rod are disposed in a mutually closed disposition and
that when said third means applies pressure to said combustion chamber face, said ring and said rod are disposed in a mutually spaced apart disposition.

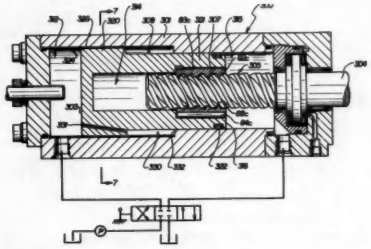
4,603,616

ROTARY ACTUATOR

Theodore S. Zajac, Bay Village, Ohio, assignor to Zaytran Inc., Elyria, Ohio

Continuation-in-part of Ser. No. 497,862, May 25, 1983, abandoned. This application Apr. 30, 1984, Ser. No. 605,656
Int. Cl.[4] F01B *3/00*
U.S. Cl. 92—33 **5 Claims**





1. Apparatus comprising:
a housing having a chamber,
a drive member mounted for rotation in said housing and extending into said chamber,
a piston disposed for axial movement in said chamber,
helical force transmitting means interconnecting said piston and said drive member for rotating said drive member with respect to said piston in response to axial movement of said piston,
port means for communicating fluid pressure to opposite ends of said piston to move said piston axially in opposite directions, respectively,
a fluid seal carried by said piston and sealingly engaging said piston and the surface of said chamber to provide fluid isolation between said opposite ends of said piston,
said housing having a first surface portion for guiding said piston in its axial movement and for preventing rotation of said piston due to the action of said force transmitting means, said first surface portion defining a first portion of

said chamber which is noncircular in its cross-section taken transverse to the axis of said piston, and said housing having a second surface portion defining a second portion of said chamber which is circular in its cross-section taken transverse to the axis of said piston,

said piston having one portion located in said first portion of said chamber and having a noncircular cross section corresponding to the cross-section of said first portion of said chamber, and said piston having another portion located in said second portion of said chamber and having a circular cross-section corresponding to the cross-section of said second portion of said chamber,

said fluid seal being carried by said circular portion of said piston and sealingly engaging said second surface portion of said housing.

4,603,617

MULTI-PART PLUNGER PISTON FOR INTERNAL COMBUSTION ENGINES

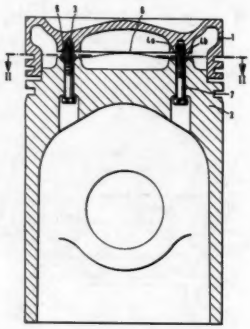
Alois Barth, Stuttgart, and Lothar Wiemann, Weinstadt-Beutelsbach, both of Fed. Rep. of Germany, assignors to Mahle GmbH, Fed. Rep. of Germany

Filed Jun. 18, 1985, Ser. No. 746,068

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423559

Int. Cl.[4] F02F *3/02*

U.S. Cl. 92—216 **4 Claims**



1. In a piston for an internal combustion engine comprising:

(a) a lower piston part having an end wall integral with a cylindrical skirt portion and means for receiving a gudgeon pin for connection of a connecting rod, said lower piston part being formed with a first annular locating surface and a first annular abutment surface lying substantially transversely of the piston axis provided radially inwardly of said first annular locating surface,

(b) an upper piston part serving as the piston head having a second annular locating surface cooperable with said first annular locating surface to ensure relative lateral location of said lower and upper piston parts and having a second annular abutment surface cooperable axially of the piston with said first annular abutment surface, and

(c) screws for bracing said lower and upper piston parts together, said screws passing through bores in said first and second abutment surfaces, the improvement comprising forming at least one of said first and second abutment surfaces with a slightly domed profile in the circumferential direction in the regions of said one abutment surface between the screws, whereby one assembly tightening of the screws effects deformation of the material in the region of the domed surfaces whereby the cooperating first and second abutment surfaces are in engagement over the regions between the screws.

4,603,618

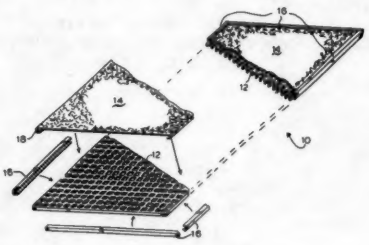
AIR FILTERING AND DISTRIBUTION FOR LAMINAR FLOW CLEAN ROOM

Soltis Charles W., P.O. Box 7328, Houston, Tex. 77248

Filed May 20, 1985, Ser. No. 735,550

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—31.5 **15 Claims**



1. An air filtering and distribution structure for use in an environmentally controlled enclosure, said structure comprising:

a first planar section spaced a predetermined distance from one surface of said enclosure, means for diffusing air through the first planar section such that the air is filtered thereby; and

a second planar section spaced a predetermined distance from and generally parallel to said first section, the second planar section comprising a plurality of membrane diffusion panels, each membrane diffusion panel comprising a frame having an open area, and a porous membrane sheet having a predetermined porosity mounted onto and extending over the frame and the open area therein with the porosity providing a predetermined resistance to flow of the air whereby during operation a slight pressure is developed between the first planar section and second planar section causing any leakage of air through the first section to be away from the controlled enclosure so that the membrane diffusion panels cooperate to provide uniform air flow through the second planar section such that the environmentally controlled enclosure achieves higher cleanliness levels for a given filtered air exchange rate than would be obtained without the membrane diffusion panels.

4,603,619

FLUE TERMINAL GAS EXTRACTOR

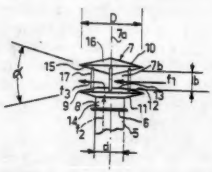
André Amphoux, 12, rue Jules César, 75012 Paris, France

Continuation-in-part of Ser. No. 227,676, Jan. 23, 1981, abandoned. This application Feb. 8, 1983, Ser. No. 464,890

Claims priority, application France, Jan. 25, 1980, 80 01636

Int. Cl.[4] F23L *17/02*

U.S. Cl. 98—59 **11 Claims**



1. A flue terminal gas extractor mounted at the discharge end of a flue and comprising a lower unit and an upper unit coaxial with said lower unit,

said lower unit comprising a downwardly facing frustoconical lower base having a central opening through which said flue extends, an upwardly facing frustoconical lower bonnet joined at its outer periphery with the outer periphery of said lower base and having a central opening in which the discharge end of the flue terminates, and

said upper unit comprising a downwardly facing conical upper base and an upwardly facing conical upper bonnet joined at their peripheries, and means mounting said upper unit in spaced relation to said lower unit with the distance between the end of said flue and a circular intersection of a projection of said flue with said upper base equal to at least one-fourth the diameter of said flue,

said lower bonnet in combination with said upper base comprising venturi means producing an area of negative pressure on the discharge end of said flue upon a generally horizontal flow of air past said extractor, and said lower base in combination with said upper bonnet comprising means for increasing the height of said negative pressure area, said lower unit and upper unit cooperating to prevent back-flow in said flue.

4,603,620

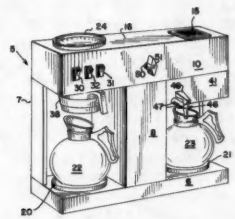
VPS WITH HOT WATER DISPENSER

Donald L. Daugherty, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Feb. 1, 1985, Ser. No. 697,259

Int. Cl.[4] A47J *31/24, 31/40*

U.S. Cl. 99—300 **6 Claims**



1. A combination beverage brewer and hot water dispenser, comprising:

a body structure;

a hot water supply tank supported by said body structure;

means for periodically introducing cool or cold water into said hot water supply tank to displace hot water therefrom and maintain a supply of hot water therein;

means for supporting a removable brewing funnel from an upper portion of said body structure above a beverage receptacle removably supported on a lower portion of said body structure;

means for conducting hot water displaced from said hot water supply tank to said brewing funnel including a sprayhead supported on said body structure so as to discharge hot water into said brewing funnel and a first hot water tube communicating between the upper portion of said hot water supply tank and said sprayhead;

a hot water dispensing tank supported by said body structure;

a hot water dispensing faucet connected with said hot water dispensing tank for dispensing hot water therefrom;

a second hot water tube in communication with the upper portion of said hot water supply tank and said hot water dispensing tank for conducting hot water displaced from said hot water supply tank to said hot water dispensing tank; and

flow control means for selectively allowing hot water displaced from said hot water supply tank to flow in only a selected one of said first and second hot water tubes.

4,603,621

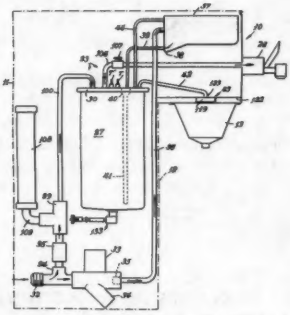
BEVERAGE-MAKING DEVICE

Melvin F. Roberts, Niles, Ill., assignor to Bloomfield Industries, Inc., Chicago, Ill.

Division of Ser. No. 633,417, Jul. 23, 1984. This application Sep. 23, 1985, Ser. No. 778,909

Int. Cl.[4] A47J *31/06*

U.S. Cl. 99—307 **5 Claims**



1. In a beverage-making device of the type generally defined by an upper and lower housing, a hot water container arranged in the lower housing, said hot water container fluidly communicating with outlet means for discharging heated water therefrom and directing the water to a perforate spray disk means, said spray disk means associating with said upper housing at an aperture therethrough whereby discharging water is directed to be dispensed downwardly therefrom, the improvement comprising a spray disk assembly having mounting collar means arranged at said upper housing and including aperture means in fluid communication with said outlet means, said mounting collar means further having a continuous downwardly open side wall, said side wall including at least one engageable slot having a downwardly open portion and a horizontal slot extending therefrom, a perforate spray disk capable of fitting within said continuous side wall, said spray disk having at least one outwardly extending portion capable of engaging said engageable slot, and a flexible gasket arranged within said mounting collar means and capable of forming a seal between said mounting collar means and spray disk upon engagement of the extending portions at said engageable slot, whereby water discharged from said outlet means is constrained to flow through said perforate disk and wherein leakage between the side wall of the mounting collar means and the spray disk is prevented.

4,603,622

FAT FRIER

Reinhold Beck, Bornweg 8, 6296 Mengerskirchen, Fed. Rep. of Germany

Filed Jan. 4, 1985, Ser. No. 688,914

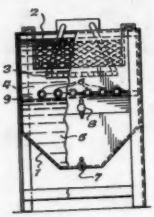
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1984, 3400241; Sep. 1, 1984, 3432246

Int. Cl.[4] A47J *37/12*

U.S. Cl. 99—331 **18 Claims**

1. A fat frier comprising a fat container having an upper zone and a lower zone, said upper zone holding a layer of fat, said lower zone holding a layer of water, the fat and water layers contacting one another to form a fat-water interface, said upper zone including porous container means for holding the material to be fried, and means for heating the fat to frying temperature, means for cooling the heater fat in the region of the fat-water interface to a temperature such that the fat in said

region remains fluid, said frier including means for draining the fat layer disposed directly beneath the fat-water interface, and



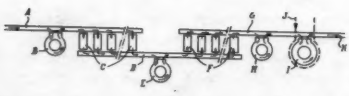
means for draining the water layer disposed at the lowest point of the lower zone of the fat container.

4,603,623

INSTALLATION FOR THE PRODUCTION OF CHEESES

Annick Le Guen, and Joseph Moutarde, both of 15, chemin de la Barre, 42210 Feurs, France

Filed Aug. 29, 1984, Ser. No. 645,355
Claims priority, application France, Aug. 30, 1983, 83 13872
Int. Cl.[4] A01J *25/00*; A23C *19/00*
U.S. Cl. 99—454 **5 Claims**



1. An installation for the production of cheeses, particularly cheeses having lactic characteristics and cheeses of the soft pasty type, said installation comprising:

a plurality of basins of semi-spherical shape and having uncluttered smooth interiors;

rotary means for metering milk into said basins;

first conveyor means for passing said basins sequentially into said rotary metering means, whereat said basins are filled with milk, and for removing the thus filled said basins from said rotary metering means;

first vertical air-conditioned silos for receiving said filled basins from said first conveyor means and for storing said filled basins for the entire duration of the time required for coagulation of said milk, thereby forming curds in said basins;

rotary means for breaking up said curds in said basins;

second conveyor means for transferring said curd containing basins from said first silos into said rotary curd breaking up means, whereat said curds in said basins are broken, and for removing therefrom said basins containing said broken curds;

second vertical silos for receiving from said second conveyor means and for storing said broken curd containing basins, during which whey separates from said curds;

means for extracting the thus separated whey from said curd containing basins;

rotary molding means for transferring said curds from said basins to molds; and

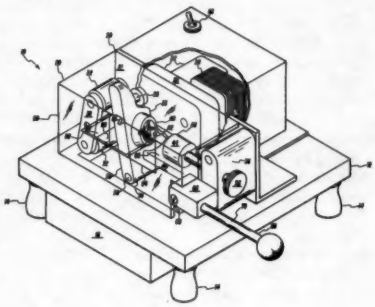
third conveyor means for transferring said basins containing separated curds and whey from said second silos to said extracting means, and for transferring said curd containing basins from said extracting means to said molding means.

4,603,624

MOTORIZED NUTCRACKER

Abraham J. Greenblatt, 6722 Waggoner Dr., Dallas, Tex. 75230

Filed May 16, 1985, Ser. No. 734,978
Int. Cl.[4] A23N *5/00*
U.S. Cl. 99—572 **10 Claims**



1. A nutcracker apparatus comprising:

a frame including means for supporting first and second jaw containing members thereon;

said first jaw containing member being supported on said frame by pivot means defining a pivot axis displaced from the jaw contained thereon for said first jaw containing member to be oscillated about said pivot axis toward and away from said second jaw containing member, said second jaw containing member being mounted stationary on said frame and facing said first jaw containing member;

means operable for engagement against said first jaw containing member for oscillating said first jaw containing member to move toward said second jaw containing member to effect crushing of a shell enclosed nut positioned between said jaw containing members; and

a nut support member disposed generally below and extending between said first and second jaw containing members in the shell crushing position of said jaw containing members relative to each other for supporting a nut to be crushed between said jaw containing members.

4,603,625

APPARATUS FOR MONITORING THE FULLNESS OF A COMPACTOR

Ronald L. Brown, Vernon, Ala., assignor to Marathon Corporation, Birmingham, Ala.

Filed Jul. 18, 1984, Ser. No. 631,998
Int. Cl.[4] B30B *1/34, 15/18*
U.S. Cl. 100—53 **19 Claims**

1. A system for monitoring the fullness of a compactor waste receiving container, comprising:

(a) a closed container having a waste receiving aperture;

(b) a compactor unit operably associated with said container and including means for receiving waste to be compacted;

(c) waste compacting ram means associated with said compactor unit aligned with said aperture and adapted for being displaced between a first waste-receiving position and a second waste-compacted position adjacent said aperture;

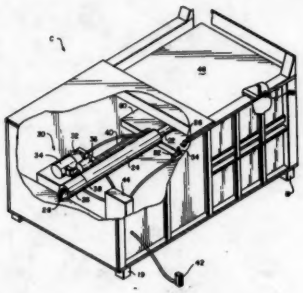
(d) cylinder and piston means associated with said compactor unit and connected to said ram means and adapted for reciprocally displacing said ram means between said first and second position;

(e) fluid supply means operably connected to said cylinder and piston means for supplying pressurized fluid thereto for displacing said ram means;

(f) control means operably associated with said fluid supply

means and adapted for interrupt the supply of pressurized fluid to said cylinder and piston means when said ram means is in said second position for thereby maintaining said ram means in said second position;

(g) fluid pressure-actuated switch means in fluid association with said cylinder and piston means and cooperating with said control means for measuring the fluid pressure of said cylinder and piston means for a pre-selected time period when said ram means is in said second position whereby



said fluid pressure is generated by compacted waste bearing against said ram means and thereby pressurizing said cylinder and piston means proportional to the fullness of said container;

(h) signal means are associated with said switch means for signaling said container fullness; and,

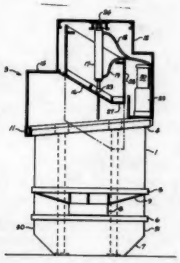
(i) means associated with said fluid supply means for preventing fluid flow from said cylinder and piston means while the fluid pressure is measured by said switch means.

4,603,626

TRASH COMPACTOR

Kenneth L. Nall, 3 Quail Hill Dr., and Floyd B. Littleton, Jr., 102 Boulder Rd., both of Greenville, S.C. 29607

Filed Nov. 9, 1984, Ser. No. 669,678
Int. Cl.[4] B30B *15/30*
U.S. Cl. 100—215 **12 Claims**



1. A trash compactor adapted for compacting trash received in a bin having an open top and slosed side walls and bottom, said compactor comprising:

a fixed support frame defining an area for removably receiving said bin with said bottom thereof positioned horizontally and with said frame horizontally in contact with one of said side walls of said bin;

compacting means, supported by said frame above said area, adapted for compacting trash received within said bin, said compacting means comprising:

a ram adapted for reciprocal motion, said ram having a single inclined surface for being driven into said bin, and

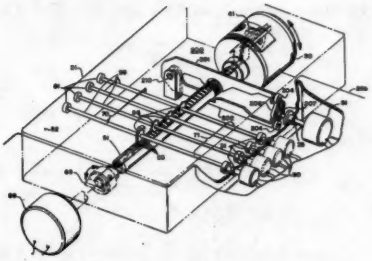
actuating means for controllably driving said ram into said bin, whereby said single inclined surface compacts trash received within said bin and simultaneously imparts a single horizontal force to said bin through said trash such that said bin is held in place against said frame.

4,603,627

ROTARY SHUTTER DEVICE FOR A POSTAL MAILING SYSTEM

Philip Pollak, Jr., Westport, and Keith E. Schubert, West Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 23, 1984, Ser. No. 592,680
Int. Cl.[4] B41L *47/46*
U.S. Cl. 101—91 **8 Claims**



1. A postage meter to be adapted to a mailing machine to form a mailing system, said mailing machine including a driving member, the meter having a housing, the meter including a rotatable drum member, a rod member extending outwardly from the drum member, the rod member having a plurality of moveable racks located axially therein, the improvement comprising a rotary shutter device, the rotary shutter device being connected to the housing of the meter, the rotary shutter device comprising: locking means substantially surrounding the rod member, the locking means further comprising a first bar member which is in mateable engagement with the racks of the postage meter, a second bar member which attachably connected to the first bar member and in mateable engagement with the rod member of the postage meter, the first bar member being in a position above the second bar member, means for biasing the first and second bar members, and a cam member, the cam member being in mateable engagement with the first and second bar members, and a shaft member which is connected to the cam member and is also adapted to engage the driving member of the mailing machine, the locking means in a first position preventing the rod member from rotating and in a second position preventing the racks from being moved.

4,603,628

SELF-INKING STAMP WITH ADJUSTABLE PRINTING MEMBERS

Walter Just, Franz Resl-Strasse 3, A-4600 Wels, Austria

Filed Jun. 26, 1985, Ser. No. 748,761
Claims priority, application Austria, Jul. 26, 1984, 2413/84
Int. Cl.[4] B41J *1/00*
U.S. Cl. 101—105 **3 Claims**

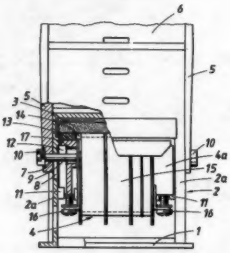
1. In a self-inking stamping device for performing an inking upstroke, comprising

a base part having a depending bearing rim for engaging a surface to be marked, and two mutually opposite end walls, each of which is formed with a cam slot and carries an inwardly protruding pin,

a downwardly exposed ink pad secured to and extending in said base part above said bearing rim,

a stamping insert disposed in said base part below said ink pad and having two mutually opposite ends facing respec-

tive ones of said end walls and provided each with a vertical track in sliding contact with one of said pins, said stamping insert also comprising a pivot extending through said cam slots, a frame pivoted on said pivot, a planar printing plate carried by said frame and formed with an aperture and provided on one side with plate type, a stamping belt unit, which is movably mounted in said frame and carries belt type facing in the same direction as said plate type and protruding through said aperture and screw means for adjusting said stamping belt unit relative to said frame in a direction which is normal to the plane of said printing plate, said stamping insert being movable between an upper position, in which said plate type and said belt type face upwardly and engage said ink pad, and a lower position, in which said plate type and said belt type face downwardly and are disposed adjacent to said bearing rim, and



an actuating member, which has two legs in sliding contact with the outside surfaces of respective ones of said end walls and is vertically movable toward and away from said bearing rim and is formed in said legs with slots, which are transverse to the vertical direction and receive said pivot,

wherein said slots in said legs, said pivot, said cam slots, said tracks and said pins are arranged to cooperate so as to move said stamping insert to said lower and upper positions, respectively, in response to a movement of said actuating member toward and away from said bearing rim,

the improvement residing in that

said frame is formed with slots extending normal to the plane of said printing plate and

said pivot is held wihout backlash in said stamping belt unit and extends through said slots in said frame so that said pivot is adjustable relative to said frame along said slots therein in unison with said stamping belt unit.

4,603,629

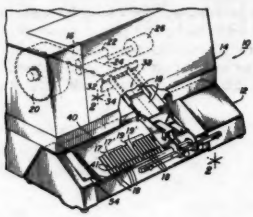
PRINTER WITH AUTOMATICALLY ADJUSTABLE STACKER

Frederick M. Pou, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sep. 5, 1985, Ser. No. 772,863
Int. Cl.[4] B41F *13/56*
U.S. Cl. 101—226 **33 Claims**

1. In a printer-stacker of the type having means for printing data onto a web of sheet stock, means for cutting the web into tags, means for storing data representative of the width and length of the tags to be printed, and a stacker for receiving and stacking the tags, said stacker having a conveyor for receiving said tags and means for advancing said conveyor a predetermined increment each time a tag is produced, the improvement comprising:

means for determining the predetermined increment of advance of said conveyor; and



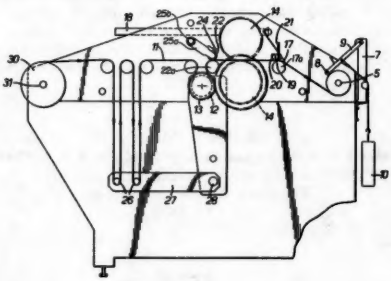
means responsive to the data storing means for altering the predetermined increment of advance as a function of the data stored therein.

4,603,630

MACHINE FOR CONTINUOUSLY PERFORATING WIDE PAPER

Manuel Martinez Llaneza, Madrid, Spain, assignor to Investronica, S.A., Madrid, Spain

Filed Jun. 13, 1984, Ser. No. 620,731
Claims priority, application Spain, Jun. 16, 1983, 523.343
Int. Cl.[4] B41F *13/56*
U.S. Cl. 101—227 **1 Claim**



1. A perforating machine for continuously perforating wide paper comprising:

a pair of lateral holders for supporting all of the elements of said machine so as to thereby insure the exact positioning thereof;

a means for actuating a plurality of perforator heads in response to movement of said paper through a precision mechanized anti-skid roller;

a tension control means for controlling the tension of said paper, said control means having swinging rollers whose movement is detected by a sensor and further having an electromagnet brake for controlling the tension of said paper by controlling the unwinding of a feed roller of said paper;

a means for winding said perforated paper including an electronically controlled direct current motor, said means for winding being arranged so as to cause said direct current motor to smoothly start and stop;

a paper flexing compensation means operatively connected to a winding mandrel for winding said perforated paper, said paper flexing compensation means compensating for flexing of said paper;

a brake means for cutting and separating said perforated paper without jamming or misaligning said paper;

a rotation detector operatively connected to said anti-skid

roller and having a counter means with a manually adjustable selector for stopping said direct current motor when said perforated roll of paper is of a length equal to a preset length which has been manually set by said adjustable selector;

an end of paper marking means including a means for measuring the length of said paper and for making a lateral line on said paper at a preset length corresponding to a value set by its manually adjustable selector, said lateral line corresponding to an end of paper warning;

an additional paper marking means including a rubber stamp carrier roller and an inking pad means for marking another lateral line on said paper during each rotation of said anti-skid roller.

4,603,631

PERFECTING PRINTING PROCESS AND APPARATUS FOR A SHEET-FED OFFSET PRESS

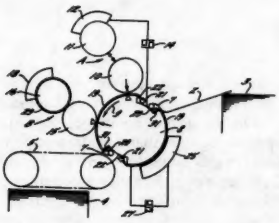
Claus Simeth, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,450

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 3403065

Int. Cl.[4] B41F *3/40*

U.S. Cl. 101—229 **14 Claims**



1. A process for perfecting printing on paper sheets wherein the first side of said sheets is printed by the offset method and the second side of said sheets is printed by direct planography by a 5-cylinder, sheet-fed offset press which comprises an impression cylinder; first and second plate cylinders; first and second blanket cylinders, said first and second blanket cylinders being disposed between said impression cylinder and, respectively, said first and second plate cylinders, the diameter (d) of said first blanket cylinder being slightly less than the dimension corresponding to an integral multiple (n) or reciprocal thereof of the effective diameter (D) of the impression cylinder; first, second, and third means for inking and damping, respectively, said first and second plate cylinders and said impression cylinder; means for selectively transferring ink indicia from said plate cylinder to said first blanket cylinder, which indicia transferring means comprise said first plate cylinder and said first inking and damping means; means for selectively activating said indicia transferring means whereby indicia are transferred selectively from said first plate cylinder to said first blanket cylinder; and first and second means for adjusting the pressure between said impression cylinder and, respectively, said first and second blanket cylinder, said process comprising:

(a) affixing at least one direct planography printing plate on said impression cylinder;

(b) disactivating said indicia transferring means whereby no indicia are transferred to said first blanket cylinder;

(c) adjusting the pressure between said first blanket cylinder and said impression cylinder to a pressure suitable for direct planography;

(d) adjusting the pressure between said second blanket cylinder and said impression cylinder to a pressure suitable for offset printing; and

(e) feeding said paper sheets through said press;

(f) printing the second side of said sheets by direct planography in the printing zone between said first blanket cylinder and said impression cylinder; and

(g) offset printing the first side of said sheets in the printing zone between said second blanket cylinder and said impression cylinder.

4,603,632

INK RETURN SYSTEM FOR PRINTING MACHINES

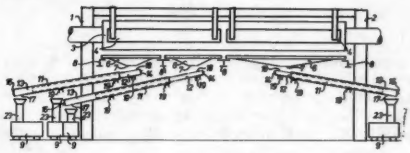
Georg Schneider, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,609

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334469

Int. Cl.[4] B41F *31/02*

U.S. Cl. 101—364 **1 Claim**



1. An ink return system for returning surplus ink to an ink receiving tank of an inking unit in a rotary printing machine, said ink return system comprising:

at least a first, generally funnel shaped ink collecting trough underlying said inking unit and receiving said surplus ink from said inking unit, said ink collecting trough including a generally downwardly extending outlet port; and

an adjustably positionable telescoping rigid ink return conduit assembly associated with said first ink collecting trough and having an inner rigid rectangular conduit and an outer rigid rectangular conduit, said inner and outer rigid rectangular conduits being telescopingly associated with each other, said inner and outer rigid rectangular conduits further including clamps for adjustable and removable attachment of said ink return system to side frames of said inking unit, a first end of said inner rigid rectangular conduit having a closed inboard end wall and an ink infeed opening provided in an upper surface of said first end of said inner rigid rectangular conduit, said ink infeed opening being positioned beneath, and being spaced from said outlet port of said ink collecting trough, a second end of said outer rigid rectrangular conduit having a closed outboard end wall and an ink drainage opening provided in a bottom surface of said second end of said outer rigid rectangular conduit, said ink drainage opening being positioned above, and being spaced from said ink receiving tank.

4,603,633

ARRANGEMENT FOR APPLICATION OF LIQUIDS, IN PARTICULAR COATING UNIT FOR A PRINTING PRESS

Johannes M. Schubert, Mainhausen, and Gerhard Geuppert, Eppertshausen, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 760,286

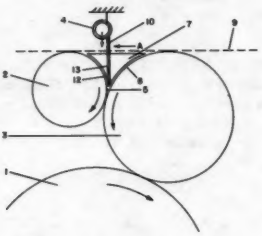
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427898

Int. Cl.[4] B41F *31/02*

U.S. Cl. 101—366 **5 Claims**

1. In an arrangement for application of liquids, such as a coating unit for a printing press for the printing and final coating of sheets including a liquid supply above the gap formed between a metering roller and an applicator roller

interacting therewith, the coating preferably being delivered uniformly by a feed pipe from several openings, with a partition designed to damp vibrations dividing the liquid supply along the length of the rollers, characterized by baffle plates at right angles to the rollers and having edges adapted to conform to the curvature of the roller surfaces to define a communicating gap with the roller surface, said baffle plates being arranged in a fixed position just inboard of the ends of the rolls, and interconnected by a partition having a continuous bottom edge defining a constant communicating gap with the applicator roller, the partition having regularly arranged communicating channels formed therein.

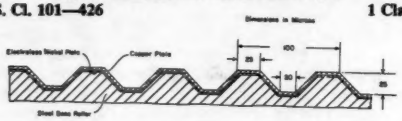


4,603,634

COPPER AND NICKEL LAYERED INK METERING ROLLER

Thomas A. Fadner, LaGrange, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 698,202, Feb. 4, 1985, Pat. No. 4,567,827.
This application Oct. 21, 1985, Ser. No. 789,851
Int. Cl.[4] B41F *31/06, 31/26;* B41L *27/28*
U.S. Cl. 101—426 **1 Claim**



1. In the process of producing an ink metering roller, the steps comprising:

a. providing an engraved base roller of suitable diameter and length;

b. electroless nickel plating said base roller to provide a thin continuous nickel layer of from 0.3 to 0.5 mil thickness;

c. heat treating said nickel plated base roller at a temperature of from about 200° to 500° F. for a time sufficient to given the nickel layer a hardness of not less than about 50 Rc and

d. copper plating said roller to provide a continuous copper layer of from bout 0.2 to 0.5 mil thickness.

4,603,635

DUAL SAFING FOR BASE ELEMENT FUZE

Jon P. Boudreau, Somerville, Mass., assignor to Avco Corporation, Wilmington, Mass.

Filed Dec. 17, 1984, Ser. No. 682,686
Int. Cl.[4] F42C *15/40*
U.S. Cl. 102—206 **8 Claims**

1. A dual safing and arming mechanism for a fuze to be used with a projectile shell adapted to be propelled into ballistic flight from the barrel of a gun, said mechanism comprising:

a case for housing the fuze mechanism in the base of the shell, said case enclosing frame members to which said fuze mechanisms are secured;

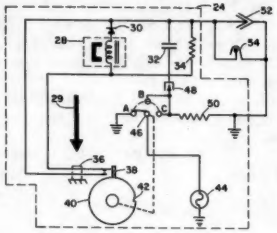
a detonator;

a rotor rotatably secured to said frame members and pivotable between first safety and armed positions, said rotor having said detonator seated therein, said rotor body forming a ground terminal for one side of said detonator, the second side of said detonator being encircuited with the center arm of a rotary switch which rotates in synchronism with said rotor as said rotor moves from first safety to the armed position;

latching means for holding said rotor in first safety condition until the occurrence of the shell firing event, the acceleration of said shell in the barrel of said gun causing release of said rotor for rotation to the armed position under the inducement of spring driving means;

a setback generator for generating a pulse of electricity during the shell firing event;

a capacitor encircuited to receive the electrical charge generated by said setback generator;



a G-switch encircuited between one side of said capacitor and the terminal of the rotary switch reached when said rotor is in the armed condition, the orientation of the G-swtich being such that it is electrically open when said shell accelerates down the gun barrel and is closed when the shell undergoes drag along its ballistic flight path;

impact operable switch means for encircuiting the second side of said capacitor in series with the grounded side of said detonator to fire same and initiate shell explosion at target impact; and

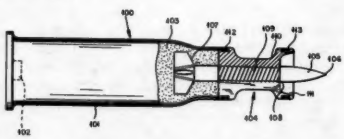
a normally open relay encircuited across said capacitor and inertially movable to the closed state to prevent the charging of said capacitor if said rotor inadvertently rests in the armed position at the firing of the gun.

4,603,636

FORM-LOCKING ARRANGEMENT FOR PROJECTILES

Peter Wallow, Düsseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,434
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326131
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—521 **18 Claims**



1. A form-locking device composed of metal for securing a sabot to a projectile which comprises a sleeve composed of high-strength elements overlapping in an axial direction, said elements defining an external surface of the sleeve provided with formations formfittingly engaging formations of said sabot, each of said elements having a cross section in an axial plane which is generally S-shaped having an inner portion

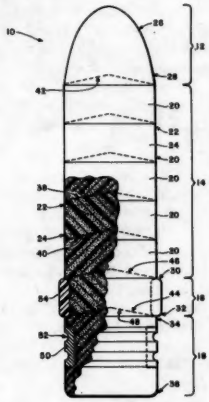
hugging said projectile and an outer portion spaced from said projectile and overlapping an inner portion of an adjacent element, the inner portions of adjacent elements being flush with one another.

4,603,637

VARIABLE DENSITY FRANGIBLE PROJECTILE

James A. Snide, and Edward J. Morrisey, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 31, 1984, Ser. No. 666,735
Int. Cl.⁴ F42B *9/20*
U.S. Cl. 102—529 **7 Claims**



1. A frangible practice projectile comprising a nose portion, a forward body portion, an after body portion and a base portion,

wherein each of said portions has a first end and a second end;

wherein the first end of said base portion, the first and second ends of each of said forward and after body portions and the second end of said nose portion include alignment means for mating and alignment with the next adjacent portion;

wherein each of said portions is bonded to the next adjacent portion;

wherein said after body portion has a first outside diameter and each of said base portion, forward body portion and nose portion has a second outside diameter, wherein said first outside diameter is greater than said second outside diameter;

wherein said base portion includes means for crimping a cartridge case thereto; and

wherein said projectile is made of a filled polymeric material wherein the filler is a metallic material selected from the group consisting of metals and metal oxides.

4,603,638

TRAIN SYSTEM WITH VARIABLY TILTING RAIL

Charles S. Dozer, Carlsbad, Calif., assignor to Charles S. Dozer Enterprises, Inc., Carlsbad, Calif.

Continuation of Ser. No. 404,819, Aug. 3, 1982, Pat. No. 4,491,073. This application Dec. 17, 1984, Ser. No. 682,534
The portion of the term of this patent subsequent to Jan. 1, 2002, has been disclaimed.
Int. Cl.⁴ B61B *3/02*
U.S. Cl. 104—95 **14 Claims**

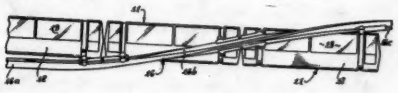
14. In a train system, the combination that comprises

(a) a train car,

(b) support for the car adapted to be guided along a rail having variable angular tilt along its length and relative to horizontal, whereby the support assumes the tilt of the rail, and

(c) a gimbal coupled between the car and support to accomodate rotation of the support relative to the car as the car travels lengthwise of and along the rail, whereby the car remains upright despite variable tilting of the rail along which the car travels,

(d) said rail having a cross section that twists and becomes substantially inverted along its length about a length axis defined by the rail,



(e) and including a hinge associated with the support and located between said rail and a gimbal axis in alignment with the car to accomodate pivoting of the car about only a single transverse hinge axis relative to the rail,

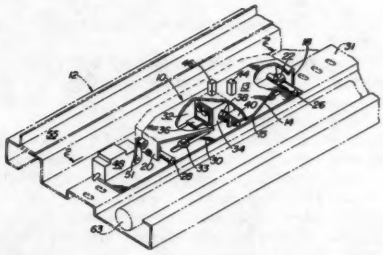
(f) the gimbal including a yoke and a ring portion carried by the yoke and rotatably guided thereby, the hinge carrying the yoke and said single axis of pivoting extending parallel to a plane defined by said ring portion, the gimbal ring, yoke, and hinge axis extending in a common plane.

4,603,639

TRAFFIC CONTROL DEVICE FOR DRIVERLESS VEHICLES

Craig F. Sleep, Bangor, Pa., assignor to SI Handling Systems Inc., Easton, Pa.

Continuation of Ser. No. 328,284, Dec. 4, 1981, abandoned. This application Mar. 20, 1984, Ser. No. 608,315
Int. Cl.⁴ B61K *7/02*
U.S. Cl. 104—252 **10 Claims**



1. A traffic control device for controlling the speed of a driverless vehicle comprising a stationary elongated base plate on which is mounted a cam, said cam having a vertically disposed deceleration surface on a side face thereof for contact with a cam follower on a driverless vehicle, said cam being mounted on said base plate for reciprocation in a horizontal direction perpendicular to the lengthwise dimension of the base plate between an operative position wherein said deceleration surface can cause a driverless vehicle to decrease speed and an inoperative position wherein said cam will not cause said vehicle to decrease speed, guide means on said base plate for guiding said movement of said cam, selectively operable motor means on said base plate for reciprocating said cam along said direction from one of said positions to the other position, said motor means including a cylinder having a piston therein and a piston rod connecting to said piston and to said cam, said piston rod and guide means extending in said direc-

tion, and stop means fixed to and projecting upwardly from said cam and adapted to selectively contact a vehicle whose speed was reduced by contact with said cam surface when the cam is in the operative position and adapted to contact a vehicle to prevent reverse movement thereof when the cam is withdrawn to the inoperative position.

4,603,640

DEVICE FOR INCREMENTALLY IDENTIFYING THE VEHICLE POSITION OF A MAGNET LEVITATION VEHICLE

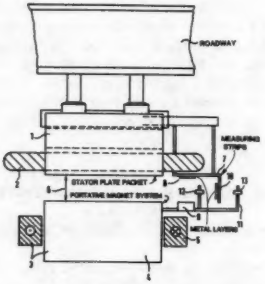
Luitpold Miller, Ottobrunn; Helmut Knöll, Erligheim, and Juergen Meins, Wolfenbuettel, all of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Continuation of Ser. No. 464,911, Feb. 8, 1983, abandoned. This application May 28, 1985, Ser. No. 738,887

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204615; Mar. 30, 1982, 3211628

Int. Cl.[4] B60L *13/06*

U.S. Cl. 104—282 **23 Claims**



1. A device for incrementally detecting the vehicle position of a magnetic levitation vehicle along a path of travel, comprising:

a plurality of sections which are spaced along the path of travel;

a drive system including a three-phase power supply and a stator plate packet having a slotted surface and a stator winding connected to said three-phase power supply and defining pole spacings;

a portative magnet spaced from said slotted surface of said stator plate packet, said portative magnet electrically excitable and cooperable with said stator to provide levitation and propulsion of the vehicle;

a first measuring strip carried by said stator plate packet and including a first metallic reference surface in a fixed position relative to said stator winding and extending in the direction of travel;

air gap detection means coupled to said first metallic surface for detecting the levitation air gap between said portative magnet and said slotted surface of said stator plate packet, said air gap detection means comprising an inductive sensor including a transmitting coil, a receiving coil and a high frequency generator connected to said transmitting coil to produce a signal to be modulated by said metallic reference surface, a band pass filter connected to said receiving coil, an amplifier connected to said filter, a demodulator connected to said amplifier for demodulating the received signal, an analog/digital converter connected to said demodulator for producing address words in response to the demodulated signals, read only memory means storing air gap information accessed by said addresses and operable to output air gap spacing information, and means operable in response to successive addresses to read the changes in air gap spacing from the information stored in said read only memory means;

a second measuring strip carried by said stator plate packet and extending in the direction of travel and including a second reference surface comprising digital coding in the direction of propagation of an ampere bar wave generated by said stator winding and having a fixed position relative to said stator winding;

code detection means mounted with said air gap detection means and carried by said portative magnet for reading said second reference surface;

said second reference surface carrying said code comprising a sequence of electrically-conductive and electrically-non-conductive elements on said reference surface;

said code detection means comprising inductive sensors operable to emit position indicating signals; and

analysis means for receiving said position indicating signals and providing information including the position of the excitation system relative to the stator winding, the direction of travel, the vehicle velocity, the vehicle location, the position of the section switches, switch location and the phase sequence of the stator winding.

4,603,641

DEVICE FOR REGISTER-MAINTAINING ALIGNMENT OF A FLEXIBLE PRINTING PLATE OF A PLATE CYLINDER OF ROTARY PRINTING MACHINE

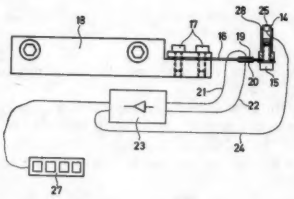
Willi Jeschke, Heidelberg, and Nikolaus Spiegel, Walldorf, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Oct. 24, 1985, Ser. No. 790,835

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1984, 3438931

Int. Cl.[4] B41F *27/06, 27/12, 33/00*

U.S. Cl. 101—415.1 **7 Claims**



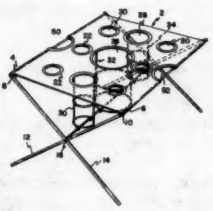
1. Device for register-maintaining alignment of a flexible printing plate of a plate cylinder of a rotary printing machine, the plate cylinder being formed with a cylinder channel, tensioning rails being disposed in the channel and clamping rails for firmly clamping a respective end of the printing plate on the tensioning rails, the tensioning rails being adjustable in peripheral direction of the plate cylinder by tensioning screws, comprising means for scanning the position of the printing plate in vicinity of a leading edge of the printing plate, and electrical display means for indicating the scanned position of the printing plate, said scanning means including sensors respectively engageable in register holes formed in the printing plate in vicinity of the leading edge of the printing plate, when the printing plate is placed upon the plate cylinder, a holder carrying said sensors and extending parallel to the axis of the plate cylinder within the cylinder channel, said sensors being pivotable in peripheral direction of the plate cylinder so that a displacement of the printing plate in peripheral direction of the plate cylinder results in a corresponding deflection of said sensors in said peripheral direction, and a measuring device operatively associated with said sensors for generating signals corresponding to a displacement of the printing plate in said peripheral direction.

4,603,642

FOLDABLE TABLE HAVING STORAGE CAPABILITIES

Harold Brickman, 2911 W. Catalpa, Chicago, Ill. 60625

Filed Nov. 29, 1984, Ser. No. 676,496
Int. Cl.[4] A47B *85/00*
U.S. Cl. 108—25 5 Claims



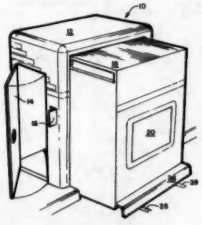
1. In a foldable table comprising a flexible table panel having a plurality of openings therein to accomodate articles for beverage consumption, a pair of legs having portions engaging opposite ends of said table panel and pivoted intermediate their lengths whereby they may spread apart to open the table for use or be brought together to permit storage and transporting the table for use, the improvement comprising open beverage consumption article holders extending downwardly from some of said openings, and a rod extending from one of the leg pivot points to another attached to the bottoms of said article holders.

4,603,643

EXPANDABLE STRUCTURE FOR AUTOMATIC TELLER MACHINES

Edward F. Couvrette, 527 10th Ave., San Diego, Calif. 92101

Filed Jun. 25, 1984, Ser. No. 624,189
Int. Cl.[4] G07G *5/00*
U.S. Cl. 109—24.1 10 Claims



1. An expandable security structure for housing an automated teller machine having customer controls, said structure has front and back adjacent surface areas comprising:

a base member fixed in place adjacent said surface areas;

a first and second section, said first section having a closed rear surface adjacent said back surface area, closed sides and an open surface adjacent said front surface area and a second section housing said automated teller machine, said second section having an open back surface, closed side surfaces and an opening adjacent said front surface area for exposing said customer controls, said second section is nestible within said first section and translatable relative thereto and said automated teller machine is translatable forwardly relative to said opening in said second section between a first operable position wherein one side thereof is substantially flush with the front of said second section and a second servicing position wherein said one side of said automated teller machine is extended exteriorly from said front of said second section;

means for translating said second section relative to said first section between a first automated teller access position wherein the two sections are nested together and a second automated teller servicing position wherein the second section is telescoped outwardly from said first section to a position over said front surface area; and

means for guiding said second section relative to said first section during translation thereof;

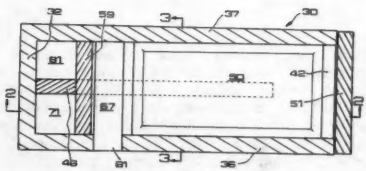
whereby when said sections are in said first nested position entry into the interior of said structure through said door is prevented by the presence of said side surface of said second section positioned beneath said door and when in said telescoped second position said side surface of said second section is translated away from beneath said door said interior of said structure is accessible through said door, the front adjacent surface is inaccessible and the rear adjacent surface remains accessible.

4,603,644

INCINERATOR AND CREMATOR

David R. Brookes, 111A Lakeshore Rd. E., Mississauga, Ontario L5G 1E2, Canada

Filed Jun. 4, 1984, Ser. No. 617,026
Claims priority, application Canada, May 18, 1984, 454735
Int. Cl.[4] F23G *1/00*
U.S. Cl. 110—194 12 Claims



1. Incinerator, having front, side, and back walls, and a roof, comprising:

a receiving chamber for receiving material to be burnt lengthwise through a doorway in the front wall of the incincerator, the floor of the receiving chamber comprising a hearth;

an afterburner chamber, which has walls that define a relatively long, narrow passage;

means for releasing oxygen in copious quantities into one end of the passage;

stack means for discharging gases from the other end of the passage;

the arrangement being such that there is a vigorous blast of oxygen-rich gases in the passage;

an opening in the wall of the passage;

where the opening is so located and arranged:

(a) as to leave the passage still well-defined in the region of the opening;

(b) as to be out of the line of the direct blast of gases in the passage;

(c) that gases outside the passage are drawn into the passage through the opening by the blast of gases in the passage;

having an ember-reducing location to which partly consumed embers in the receiving chamber may be moved;

where the ember-reducing location is just below the said opening, to the extent that gases rising from the location are drawn directly towards and through the opening and into the passage;

where, in a cross-section taken on a vertical longitudinal plane of the incinerator, the ember-reducing location is widely spaced from the outside walls of the incinerator;

and having an ash removal port from which the fully con-

sumed embers, in the form of ash, may be removed from the incinerator;

wherein the ash removal port is in one of the side walls of the incinerator; and wherein said ember-reducing location is an ash-trough, disposed at the back of the hearth, into which embers may be pushed from the doorway.

4,603,645

SEEDER WITH SOWING SHARES

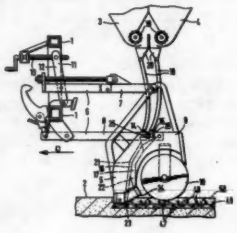
Benno Wiemeyer, Lotte-Halen, Fed. Rep. of Germany, assignor to Amazonen Werke AG H. Dreyer GmbH & Co. KG, Hasbergen- Gaste, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,076

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332352

Int. Cl.[4] B65G *11/00*

U.S. Cl. 111—1 **11 Claims**



1. In a field working, plural material dispensing machine comprising at least two reservoirs for dispensing at least two different materials; soil opening shares for incorporating said plural materials, each sowing share having a body defining at least two separate material inlets and outlets; a supply hose communicating each material inlet of each opener to each reservoir, the improvement comprising: guide valve means for selectively diverting the flow of each respective material from each hose to at least one of said at least two separate material outlets in each share, said guide valve means located between said reservoirs and said at least two material outlets of each share whereby material carried by each hose can be selectively diverted to exit from at least a selected one of said at least two separate material outlets of each respective share.

4,603,646

EMBROIDERY MACHINE FRAMEWORK

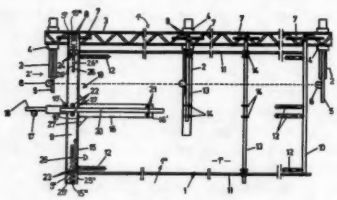
Karl Jenni, Hohenems, Austria, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Oct. 15, 1984, Ser. No. 660,807

Claims priority, application Austria, Oct. 20, 1983, 3735/83

Int. Cl.[4] D05C *9/14*

U.S. Cl. 112—90 **14 Claims**



1. An embroidery machine comprising:

an embroidery framework;

at least one support for supporting the embroidery framework;

said embroidery framework containing a circumferentially closed embroidery frame supported at said at least one support;

said embroidery frame containing at least one side member;

vertical drive means for substantially vertically displacing said embroidery framework;

said at least one support being substantially vertically displaceable by said vertical drive means;

horizontal drive means for substantially horizontally displacing said embroidery frame;

at least one substantially vertically extending guide rail at which said at least one side member of said embroidery frame is guided for displacement in essentially vertical direction;

at least one substantially horizontal bracket projecting from said at least one substantially vertically extending guide rail;

said at least one substantially horizontal bracket and said at least one substantially vertically extending guide rail conjointly forming at least one substantially T-shaped constructional unit essentially resistant to bending;

a stationary machine stand;

said at least one substantially horizontal bracket being substantially horizontally guided at said stationary machine stand; and

said horizontal drive means acting upon said at least one constructional unit comprising said at least one substantially horizontal bracket and said at least one substantially vertically extending guide rail.

4,603,647

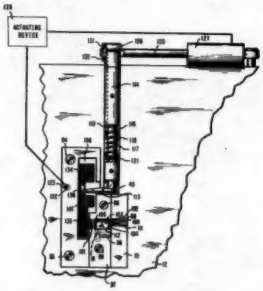
SEWING MACHINE WITH EDGE TRIMMER

Ralph F. Conley, Jr., Miamisburg, and Ricky F. Frye, Waynesville, both of Ohio, assignors to MIM Industries, Inc., Miamisburg, Ohio

Filed Jan. 14, 1985, Ser. No. 691,430

Int. Cl.[4] D05B *65/02*

U.S. Cl. 112—129 **7 Claims**



1. In a chainstitch machine that includes a looper, a looper support, a needle, a needle support to support the needle for reciprocating motion carrying a first thread along a needle path toward and away from the looper as the looper carries a second thread in repetitive oscillations in a looper path close to the needle path, driving mechanism common to both the needle support and the looper support to supply oscillatory force to both of the supports synchronously to form chain stitches of the threads at a stitch-forming location, a knife, and a guide structure to guide movement of the knife close to the needle path and toward the looper path, the invention comprising:

a. an actuating linkage connecting the knife to the driving mechanism and comprising:

(i) a drive shaft oscillating about its axis,

(ii) a bracket extending in a generally lateral direction from the drive shaft,

(iii) a joint having an axis parallel to the axis of the shaft, the joint being movable along the bracket between a first location, in which the axis of the joint is offset from the axis of the drive shaft, and a second location, in which the axis of the joint is substantially closer to the axis of the shaft, the first location corresponding to the operative position of the actuating linkage and the second location corresponding to the inoperative position of the linkage, and

(iv) connecting means connecting the joint to the knife; and

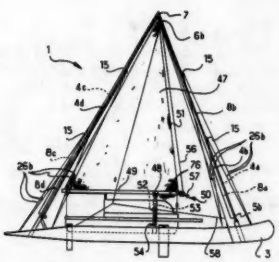
b. control means connected to the actuating linkage to shift the actuating linkage between an operative position, in which the knife is positioned in a trimming location close to the throat plate and the actuating linkage transmits to the knife a reciprocating trimming force that has a predetermined magnitude and is synchronous with the oscillatory force supplied to the needle support and that causes a portion of the knife periodically to enter the stitch-forming location, and an inoperative position in which the knife is retracted from the throat plate and the actuating linkage transmits to the knife a reciprocating force that has a magnitude substantially less than the predetermined magnitude of the trimming force.

4,603,648

WATERCRAFT WITH AT LEAST TWO TWIN HULLS

Jacques Berge, Château d'Areyt, 65400 Préchac, France

Filed May 8, 1984, Ser. No. 608,232
Claims priority, application France, May 9, 1983, 83 07747
Int. Cl.⁴ B63H *9/04*
U.S. Cl. 114—39 **21 Claims**



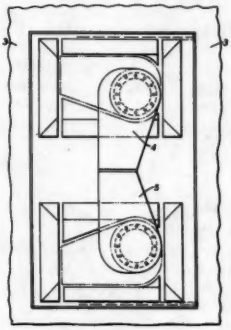
1. A catamaran-type sail boat comprising at least two separate hulls, connecting means between said hulls comprising several inclined mast-like elements, each having an upper end and a lower end, lower connecting means between the lower end of each inclined mast-like element and the respective hull, upper connecting means for connecting together the upper ends of at least some of said masts providing thereby a rigid-type connection between said hulls, deck means secured to said hulls, and further at least some of said inclined mast elements are each provided over at least a portion of their length with a fin rigidly connected to a respective mast element, said lower and upper connecting means respectively of the lower end and the upper end of said inclined mast element provided with said fin allowing the rotation of each of said inclined mast elements around the longitudinal axis thereof, said fin working as a sail.

4,603,649

CLOSEABLE RESTRAINT FOR MAINTAINING A TOW LINE BETWEEN GUIDE PINS ON A BOAT

Per H. Hystad, N-4250 Kopervik, Norway

Filed Jul. 31, 1984, Ser. No. 636,157
Claims priority, application Norway, Aug. 17, 1983, 832963
Int. Cl.⁴ B63B *21/02*
U.S. Cl. 114—199 **2 Claims**



1. A closeable restraint for maintaining a tow line between a pair of guide pins on a boat, comprising:

a rotatable locking member on each of said pins at the upper end thereof, said locking members each being rotatable toward each other to define a barrier across the upper end of said pins when closed, and

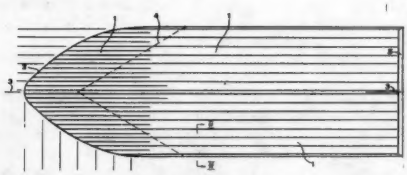
means for raising and lowering each of said pins, rotary means connected to each of said pins and responsive to the movement thereof for opening and closing said barrier; said rotary means each including a stationary member and a tubular segment, each of said tubular segments having a guide groove therein which follows a generally straight vertical path and then a laterally deflected path toward the upper end thereof, said grooves of the tubular segments being mirror images of each other, said stationary member engaging said groove, and causing said tubular segment to rotate as it tracks said groove, one segment clockwise and the other counterclockwise, thereby operating said locking member.

4,603,650

BOAT, THE BOTTOM OF WHICH IS PROVIDED WITH A PLURALITY OF DOWNWARDLY OPENING CHANNELS

Tord Björn, Flöjtvägen 2, S-890 10 Bjästa, Sweden

Filed Oct. 15, 1984, Ser. No. 661,071
Int. Cl.⁴ B63B *1/32*
U.S. Cl. 114—288 **1 Claim**



1. A boat hull having a keel line and a stem, said boat hull including a bottom which has a plurality of downwardly opening channels for receiving air during the forward movement of the boat in order to produce a reduction of the friction between the water and the bottom surface, said channels extending, viewed from above and from below respectively, along their

whole length generally parallel to said keel line in the direction astern from places at said stem above the water surface to places under the water surface, an individual channel being limited laterally by two primarily vertical wall portions and upper surfaces of the channels being primarily horizontal, a certain plurality of adjacent ones of said channels localized on the same side of said keel line and having their upper primarily horizontal surfaces at different levels at the region of said stem merging into a single channel with a common primarily horizontal upper surface in the direction astern, said vertical wall portions which delimit said certain adjacent channels from each other being at least partly formed by a single downwardly projecting projection which where said certain adjacent channels merge into a single channel is gradually reduced in height while the upper surfaces of said certain adjacent channels gradually come closer to the levels of each other.

4,603,651

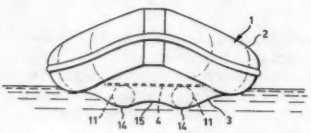
INFLATABLE BOAT

Richard J. A. Harding, Kidwelly, Wales, assignor to Avon Inflatables Limited, Great Britain

Continuation of Ser. No. 106,018, Dec. 21, 1979, abandoned. This application Dec. 14, 1981, Ser. No. 330,591

Int. Cl.[4] B63B *7/08*

U.S. Cl. 114—345 **9 Claims**



1. A load carrying inflatable boat capable of carrying a plurality of passengers and capable of planing and comprising:

a flexible skin defining the bottom of the boat;

a member having a rigid reaction surface overlying the skin; and

at least one inflatable member between said skin and said reaction surface to define twin inflated parallel keels engaging deepest into the water when the boat is on water, the keels being parallel to the center line of the boat and spaced from it at respective sides thereof, the skin forming a continuously water-contacting planing surface of the boat between the keels, the planing surface having a concave cross-section, the concavity of which is variable in accordance with the loading experienced on water so as to adapt the shape of the water-contacting planing surface to load conditions.

4,603,652

DEVICE FOR FASTENING FLAGS OR THE LIKE TO THEIR STAFF OR THE LIKE AVOIDING WINDING THEREOF

Blandine Thibault, and Delphine Thibault, both of 5, rue Alfred Roll, 75017 Paris, France

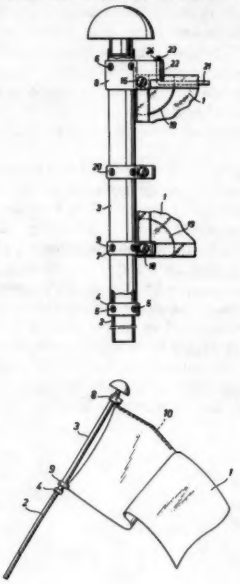
Filed Jul. 9, 1985, Ser. No. 753,080

Claims priority, application France, Jul. 9, 1984, 84 10886

Int. Cl.[4] G09F *17/00*

U.S. Cl. 116—174 **3 Claims**

1. A device for fastening a flag on a staff via a sleeve coaxial to the staff mounted to rotate freely on the staff, the flag being able to exert on the sleeve, under the effect of the wind and/or the weight of the flag, a torque tending to rotate the sleeve and to avoid the flag winding therearound, wherein said device comprises a rod having two ends, a first end being connected to the sleeve so that the rod extends, at least partially, in a plane substantially transverse to the sleeve, the second end of the rod being remote from the sleeve and connected to the flag, whereby the torque exerted by the flag on the sleeve under the effect of the wind and/or of the weight of the flag is increased, and wherein the device further includes a means for retaining the sleeve on the staff, a lower ring and an upper ring for fastening the flag on the sleeve, the upper ring having a passage



parallel to the staff for receiving a pivot part of the rod, the rod being constituted by a bent tube forming the pivot part and tubular extension part, and by a bent rod received in the tubular extension part.

4,603,653

MARINE ANTIFOULING MATERIALS AND MARKERS

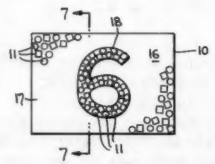
Andrew M. Bews, Edinburgh, Scotland, assignor to United Wire Group, Edinburgh, Scotland

Continuation-in-part of Ser. No. 532,045, Sep. 14, 1983, abandoned. This application Aug. 29, 1985, Ser. No. 770,792

Claims priority, application United Kingdom, Sep. 14, 1982, 8226183

Int. Cl.[4] B63B *59/04*

U.S. Cl. 116—209 **22 Claims**



1. A marine antifouling material for providing an antifouling surface for use in sea water, comprising a layer of inert, water-insoluble, flexible and extensible elastomeric carrier material having an outer surface and an opposed inner surface and having embedded therein a single layer only of a plurality of copper or copper alloy particles, all of said particles being essentially of the same size in the range of 0.5 to 3.0 mm, the

ratios of the major dimensions of said particles all being in the range of about 0.7 to 1.0, and said single layer having a maximum thickness equal to the size of said particles, all of said particles being exposed at said outer surface of said carrier material to provide a multiplicity of generally evenly sized discrete copper areas in the inert material continuum outer surface, said areas being spaced by 0.5 to 0.75 mm, the total area of the spaced copper areas being between 20 and 40% of the total area of the antifouling surface of said antifouling material, said layer of particles being spaced from the opposed inner surface of said carrier material whereby said inner surface has no copper exposed thereat, and wherein said antifouling surface of said antifouling material is accessible to sea water and the multiplicity of spaced copper areas thereon retard or prevent marine growth on said antifouling surface.

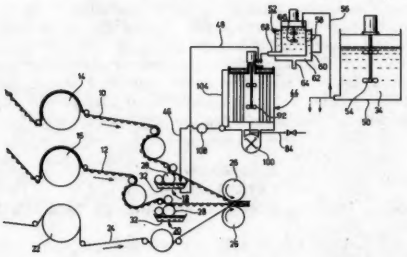
12. A marine identification marker for attachment to a submerged or submersible structure to provide an identification member thereon, said marker comprising a unitary support having a display surface, the display surface including an alphanumeric portion of contrasting color to that of the remainder of said display surface, and wherein either said alphanumeric portion or said remainder, or both are formed from an antifouling material comprising a layer of inert, water-insoluble, flexible and extensible elastomeric carrier material having first and second opposed surfaces and, embedded in said material, a single layer only of a plurality of copper or copper alloy particles, all of said particles being of essentially the same size in the range of 0.5 to 3.0 mm, the ratios of the major dimensions thereof all being the range of about 0.7 to 1.0, and said single layer having a maximum thickness equal to the size of said particles, all of said particles being exposed at said first surface of said carrier material to provide a multiplicity of generally evenly sized discrete copper areas in the inert material continuum surface, said areas being spaced by 0.5 to 0.75 mm, the total area of the spaced metal areas being between 20 and 40% of the total area of said first surface, said layer of particles being spaced from said second surface of said material whereby said second surface has no metal exposed thereat, said carrier material including a coloring pigment dispersed therein, and wherein said second surface of said material is attachable to said structure whereby said first surface of said material is accessible to sea water and the multiplicity of spaced metal areas thereon retard or prevent marine growth on said first surface.

4,603,654

GLUE APPLICATOR FOR CORRUGATOR MACHINES

Kazuo Mori, Kyoto, and Eiichi Isowa, Nagoya, both of Japan, assignors to Isowa Industry Company, Ltd., Nagoya, Japan

Filed Feb. 20, 1985, Ser. No. 703,476
Claims priority, application Japan, Feb. 20, 1984, 59-30898
Int. Cl.[4] B05C *1/08, 1/16*
U.S. Cl. 118—202 **20 Claims**



1. Glue applicator apparatus, for use with a system in which glue disposed within a glue pan is applied to the ridge portions of a corrugated core sheet, comprising:

tank means for holding a stock of said glue;

glue heating means for providing heated glue to said glue pan, including a first upper glue pool chamber into which said glue from said tank means is deposited; a second upper glue pool chamber, separated from said first upper glue pool chamber, from which said heated glue is discharged to said glue pan; a lower glue pool chamber, vertically spaced below said first and second upper glue pool chambers, for transferring said glue from said first upper glue pool chamber to said second upper glue pool chamber; a heat medium chamber, defined between said upper glue pool chambers and said lower glue pool chamber, for containing a heat medium; a first set of vertically extending heat exchanger pipes, interposed between said first upper glue pool chamber and said lower glue pool chamber and extending through said heat medium chamber in a heat exchange relationship with said heat medium disposed within said heat medium chamber, for transferring said glue from said first upper glue pool chamber to said lower glue pool chamber; a second set of vertically extending heat exchanger pipes, interposed between said lower glue pool chamber and said second upper glue pool chamber and extending through said heat medium chamber in a heat exchange relationship with said heat medium disposed within said heat medium chamber, for transferring said glue from said lower glue pool chamber to said second upper glue pool chamber; and a steam inlet feed pipe fluidically connected to said heat medium chamber for providing steam thereinto;

first conduit means for conducting said glue from said tank means to said first upper glue pool chamber of said glue heating means; and

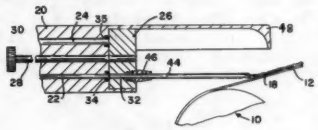
second conduit means for conducting said heated glue from said second upper glue pool chamber to said glue pan.

4,603,655

LIQUID APPLICATOR FOR A PRINTING PRESS

Thomas G. Switall, Wheeling, Ill., assignor to Ryco Graphic Manufacturing, Inc., Wheeling, Ill.

Filed May 13, 1985, Ser. No. 733,386
Int. Cl.[4] B05B *15/02*
U.S. Cl. 118—302 **7 Claims**



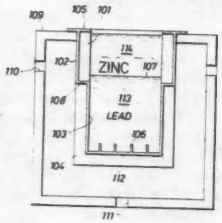
1. An applicator for applying liquid such as glue to a web of paper as it is moving through a printing press, said applicator comprising a body member having separate first and second fluid conduits extending therethrough for connecting to separate liquid and purge fluid sources, a head member mounted for movement relative to said body member, said head member having a fluid conduit therethrough aligned with the first fluid conduit in said body member in a first relative position of said members and aligned with the second fluid conduit in said body member in the second relative position of said members, a fluid dispensing tip mounted on said head member in fluid communication with the fluid conduit through said head member such that when said members are in said first relative position, the outer end of said tip will be positionied in close proximity to the surface of said web of paper, and when said members are in said second relative position, the outer end of said tip will be positioned remote from the surface of the web of paper, and means for effecting movement of said members between said first and second relative positions, whereby said tip may selectively apply liquid to the paper or be purged of liquid remote from the paper.

4,603,656

GALVANIZING APPARATUS

Frederick O. Jaye, Jr., 819 Crossroads Dr., Houston, Tex. 77079

Filed Nov. 9, 1984, Ser. No. 669,809
Int. Cl.[4] B05C 3/02
U.S. Cl. 118—429 1 Claim



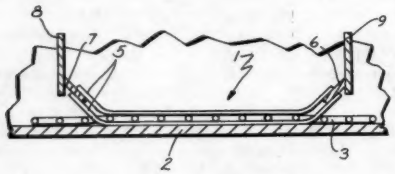
1. Apparatus for galvanizing articles sought to be plated comprising a kettle having a side wall and a bottom wall for containing a molten bath, a refractory material liner within the interior of the kettle adjoining the side wall thereof at the upper portion of the sidewall, firebox means in spaced and surrounding relationship to both the side wall and the bottom wall of the kettle, a plurality of heat exchange fins extending from the bottom wall of the kettle and at least from the exterior of a portion of the sidewall of the kettle, a second plurality of heat exchange fins extending upwardly from the bottom wall and into the interior of the kettle, said side wall including a first and a second section joined one to another by a ledge extending substantially parallel to the bottom wall, a flange connected to the top of the first section being of a diameter substantially in excess of the diameter of the second section, said liner being disposed between said ledge and said flange, said refractory liner being a material selected from the group consisting of alundum, aluminum oxide, bauxite brick, chrome brick, fireclay brick, magnesite brick, silica brick, silicon carbide, and zirconia brick, the bottom wall and the side wall of the kettle being constructed of a high strength steel, said kettle containing a first molten bath and a second molten zinc bath thereabove with the interface between the two baths being maintained in the area of the side wall in contact with the refractory liner, said first molten bath being lead or tin.

4,603,657

FEED TROUGH FOR POULTRY CAGES, ESPECIALLY PULLET CAGES

Hubert Peckskamp, Lohnr, Fed. Rep. of Germany, assignor to USI Agri-Business Company Inc., New Holland, Pa.

Filed Mar. 15, 1985, Ser. No. 712,278
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409507
Int. Cl.[4] A01K 39/014
U.S. Cl. 119—18 16 Claims



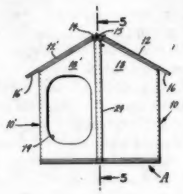
1. A feed trough for poultry battery cages, particularly chick breeding cages, comprising a trough channel with a feed conveyor chain running therein and with a grid disposed thereabove, wherein each grid consists of grid bars extending in a parallel relationship to one another in the longitudinal direction of the trough channel; cross connection means located only at the end regions of said grid bars for supporting said grid bars in said parallel relationship; and support means for supporting the grid bars in one predetermined position within said trough channel.

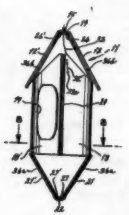
4,603,658

COLLAPSIBLE STRUCTURE

Roger L. Garnsey, 1003 E. Fifth Ave., Monmouth, Ill. 61462

Filed Nov. 29, 1984, Ser. No. 676,083
Int. Cl.[4] E04B 1/343; A01K 1/00
U.S. Cl. 119—19 12 Claims





1. A collapsible, easily relocatable structure for erection on a supporting surface, comprising side wall panels, a roof joined to the side wall panels and constituted by a pair of opposed, flat roof panels hingedly joined to the respective side wall panels and hingedly secured centrally, a floor constituted by a pair of flat floor panels hingedly joined to respective lower edges of the side wall panels and including inner edges hingedly secured centrally, opposite ends each comprising a pair of flat end panels hingedly secured to the side wall panels and hingedly secured centrally, and characterized by the structure being collapsible by outward folding of the roof panels, inward folding of each of the pairs of end panels, and outward folding of the floor panels with the hingedly secured inner edges of the floor panels extending beyond and below the side wall lower edges for first contacting the supporting structure when the collapsed structure is lowered to the supporting surface, and means for locking the panels in unfolded configuration for maintaining the shelter in an erected condition.

4,603,659

ADJUSTABLE MUZZLE

Marvin G. Helphrey, 3647 Avocado Blvd., La Mesa, Calif. 92041

Filed Jul. 29, 1985, Ser. No. 759,825
Int. Cl.[4] A01K 25/00
U.S. Cl. 119—130 5 Claims

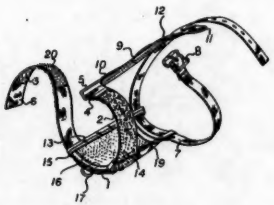
1. A muzzle for dogs comprising:

a loop member for encircling the dog's snout having an adjustable means for securing said loop member around the snout;

a collar member for encircling the dog's neck, having an

adjustable means for securing said member around the neck;

a nose bridge having means for connecting its rear end and front end to said collar and loop members respectively, wherein said means for connecting rear end is adjustable along the length of said nose bridge;



a pair of lateral supports, each having means for connecting its rear end and front end to said collar and loop members respectively, wherein said means for connecting the rear end is adjustable along the length of said lateral supports, and said means for connecting the front end is adjustable along the length of the loop member; and

a web connecting said lateral supports and supporting the chin of the dog.

4,603,660

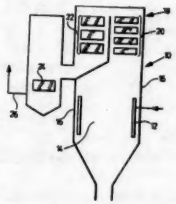
CONVECTION SECTION ASH MONITORING

John R. Wynnyckyj, Kitchener; Edward Rhodes, Waterloo, and Robert Marr, Kitchener, all of Canada, assignors to University of Waterloo, Waterloo, Canada

Division of Ser. No. 583,573, Feb. 24, 1984, Pat. No. 4,556,019. This application Apr. 1, 1985, Ser. No. 718,711

Int. Cl.[4] F28G *13/00*

U.S. Cl. 122—379 **9 Claims**



1. In a steam generating apparatus comprising a combustion section wherein fuel is burned in an air stream to generate heat and to produce a hot combustion products gas stream, a convection section connected to said combustion section by conveying passage means to permit the flow of said hot combustion products gas stream from said combustion section to said convection section, and heat exchange tubes located in said convection section transverse to the intended direction of gas flow through said convection section so as to contact the hot combustion products gas stream and having steam of temperature lower than that of the hot combustion products gas stream passing therethrough, said heat exchange tubes being arranged in a plurality of banks of said heat exchange tubes, the improvement which comprises:

a temperature detection means provided upstream of each bank of heat exchange tubes and downstream of the last bank to determine the fall in temperature across each bank, each of said temperature detection means being capable of directly measuring the temperature of said hot combustion products gas stream at the locations of said temperature detection means;

means for on-line calculation of a fouling factor (R_F) for each said bank of heat exchange tubes from the difference in temperature thereacross determined by said temperature detection means; and

means for activating soot blowers to effect cleaning of a selected bank of heat exchange tubes in response to a predetermined value of said fouling factor for said selected bank.

4,603,661

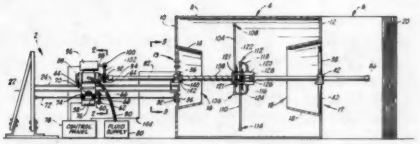
HYDROBLAST CYCLONE CLEANER APPARATUS AND METHOD

Charles R. Nelson, Morris, and Cris R. Lehman, Dwight, both of Ill., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 2, 1985, Ser. No. 688,221

Int. Cl.[4] F22B *37/52*

U.S. Cl. 122—392 **19 Claims**



1. An apparatus for cleaning a cyclone with a fluid from a fluid source, said cyclone including a side wall, a first end wall having an inlet opening, a second end wall having an outlet opening, an inlet wall extending inwardly from said first end wall and spaced from said side wall, and an outlet wall extending inwardly from said second end wall and spaced from said side wall, said apparatus comprising:

support means for providing a support adjacent said first end wall;

a carriage movably mounted on said support means;

carriage movement means for moving said carriage toward and away from said first end wall;

conduit means for conducting said fluid into said cyclone;

swivel means, mounted on said carriage, for rotating said conduit means;

fluid lance means, connected to said conduit means for rotational movement therewith, for conducting said fluid from said conduit means;

fluid lance movement means for moving said fluid lance means transversely to said conduit means; and

nozzle means, connectible to said fluid lance means, for creating a selectable one of a longitudinal spray to clean the interior surfaces of said first and second end walls and a transverse spray to clean the interior surfaces of said side wall, said inlet wall and said outlet wall.

4,603,662

FUELS

John H. R. Norton, Johannesburg, and Peter R. Rebello, Hurleyvale, both of South Africa, assignors to AECI Limited, Johannesburg, South Africa

Filed May 2, 1980, Ser. No. 146,367

Claims priority, application South Africa, May 14, 1979, 79/2323

Int. Cl.[4] F02B *75/12;* **C10L** *1/02*

U.S. Cl. 123—1 A **2 Claims**

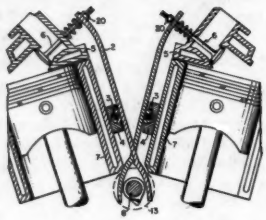
1. A method of running a compression ignition engine having a cylinder, a fuel injector into the cylinder, and an air inlet manifold leading to the cylinder, which method comprises injecting at least one alcohol into the engine through the fuel injector and at least one ether into the engine through the air inlet manifold.

4,603,663

ROCKERARM SYSTEM FOR CONTROLLING VALVES IN AN INTERNAL COMBUSTION ENGINE

Joseph Giocastro, 6428 Metropolitan Ave., Middle Village, N.Y. 11379

Filed Nov. 1, 1983, Ser. No. 547,435
Int. Cl.[4] F01L *1/34*
U.S. Cl. 123—90.17 3 Claims



1. A rocker arm system for an internal combustion engine, comprising, in combination,

at least one engine unit including a cylinder block having a top side and an opposed bottom side and a side wall extending between said top and bottom sides,

a cylinder head mounted to said top side of said cylinder block,

valve means seated in and operatively connected to said cylinder head and movable between open and closed positions, said valve means including biasing means for moving said valve means from said open position to said closed position, said valve means including a valve stem, said valve stem having a stem end and extending to said side wall of said cylinder block, said valve means entering said cylinder head from a position above said cylinder head,

cam means positioned proximate to said side wall of said cylinder block,

arm means rotatably connected to said side wall of said cylinder block and extending between and operatively positioned relative to said cam means and said valve means, said arm means being movable between first and second positions, wherein in said first position said arm means is free of pressure contact with said cam means and said valve means, and in said second position said arm means is in pressure contact with said cam means and with said valve means wherein said valve means has been moved to said open position by said arm means, said arm means being movable from said second position to said first position by said biasing means of said valve means upon release of said arm means from said second position by said cam means, said arm means including an arm member having opposed top and bottom end portions, said arm member being substantially straight in structure and substantially parallel to said side wall of said cylinder block, said top end portion having a bend portion configured to be in perpendicular operative contact with said stem end of said valve stem,

mounting means secured to said side wall of said cylinder block for rotatably connecting said arm means to said cylinder block for movement between said first and second positions,

a crankshaft driven by the piston of said cylinder block positioned proximate to said bottom side of said cylinder block,

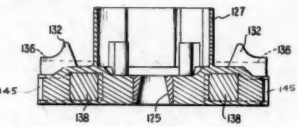
gearing means associated with said crankshaft and with said crankshaft for moving said cam means between said first and second positions so as to operate said arm means and said valve means in timed sequence for operation of said engine.

4,603,664

MAGNETIC STRUCTURE FOR USE IN A CHAIN SAW OR EDGE TRIMMER IGNITION SYSTEM OR THE LIKE

Robert V. Jackson, Los Angeles, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Feb. 20, 1985, Ser. No. 703,544
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—149 D 21 Claims



1. In a magneto ignition system including a flywheel lying in a plane having an axis of rotation perpendicular to said plane of the flywheel and at least one magnetic structure embedded in the periphery thereof, a magnetically permeable core disposed adjacent said flywheel, a coil wound on said core and connected to an ignition circuit so that a voltage waveform is induced in said coil and applied to said circuit each time the magnetic structure passes the coil, said waveform having at least a first positive alternation followed by a negative alternation and then a second positive alternation and where said magnetic structure includes (a) a magnet having first and second end faces and (b) first and second pole pieces where said pole pieces have (i) first portions which respectively engage said end faces and (ii) second portions which respectively include pole faces on said flywheel periphery, the improvement comprising:

said pole pieces being assymetrical in a plane perpendicular to the plane of the flywheel such that the said second portions of the pole pieces have a width in the direction of the axis of rotation of the flywheel in said perpendicular plane which is less than the width in the direction of the axis of rotation of the flywheel in said perpendicular plane of the said first portions thereof to thereby effect concentration of the flux produced by said magnet at said pole faces to thereby permit a reduction in the size of the magnet without substantially lessening the energy in said negative and second positive alternations of the voltage waveform applied to the ignition circuit.

4,603,665

HYPEREUTECTIC ALUMINUM-SILICON CASTING ALLOY

William G. Hesterberg; Raymond J. Donahue, and Benjamin L. Sheaffer, all of Fond du Lac, Wis., assignors to Brunswick Corp., Skokie, Ill.

Filed Apr. 15, 1985, Ser. No. 723,058
Int. Cl.[4] C22C *21/02;* F02F *7/00*
U.S. Cl. 123—195 R 4 Claims

1. An engine block for an internal combustion engine, comprising a cast block composed of a hypereutectic aluminum silicon alloy and having at least one cylinder bore therein, said alloy consisting essentially of 16% to 19% by weight of silicon, 0.4% to 0.7% by weight of magnesium, up to 1.4% by weight of iron, up to 0.3% by weight of manganese, up to 0.37% by weight of copper, and the balance aluminum, said alloy having excellent fluidity, a solidification range of less than 150° F., and having a weight loss of less than 1.0% when exposed for 200 hours at ambient temperature in a 5% sodium chloride solution.

4. A method of casting an engine block, comprising the steps of forming a mold having a plurality of non-metallic cores constructed and arranged to form cylinder bores in the cast engine block, preparing a hypereutectic aluminum-silicon alloy consisting essentially by weight of 16% to 19% of silicon, 0.4% to 0.7% of magnesium, up to 1.4% iron, up to 0.3% of manga-

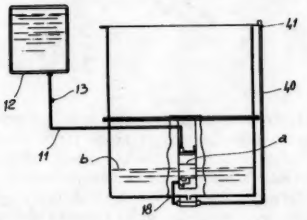
nese, up to 0.37% copper, and the balance aluminum, a solidification range of less than 150° F., and having a weight loss of less than 1% when exposed for 200 hours at ambient temperature in a 5% sodium chloride solution, casting said alloy into the mold and into contact with said cores, and cooling the cast alloy to produce a solidified cast engine block having precipitated silicon crystals substantially uniformly distributed throughout said cast block.

4,603,666

DEVICE FOR MAINTAINING A CONSTANT OIL LEVEL

Giuseppe Martinelli, Via Fratelli Rosselli, 21/3, 20100 - Milano, Italy

Filed May 6, 1985, Ser. No. 731,060
Claims priority, application Italy, May 11, 1984, 20884 A/84
Int. Cl.[4] F01M *1/00*
U.S. Cl. 123—196 S 10 Claims



1. A device for maintaining constant the level of oil in an internal combustion engine, said internal combustion engine having a sump (**20**), which comprises a constant level reservoir (**1**), a duct (**15**) connecting said constant level reservoir to the bottom of the sump, whereby the level within the sump is maintained at the level in the constant level reservoir, a reserve reservoir, (**12**), positioned at a level higher than the constant level reservoir, outside the sump, duct means (**11**) for placing said constant level reservoir in communication with said reserve reservoir, float means (**21**) in said constant level reservoir for controlling flow in said duct means.

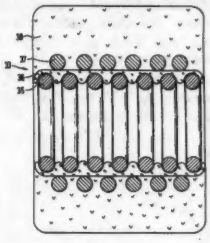
4,603,667

DEVICE FOR FUEL INJECTION IN COMBUSTION CHAMBERS

Werner Grünwald, Gerlingen; Ernst Imhof, Münchingen; Iwan Komaroff, Regensburg; Günther Schmid, Stuttgart, and Kurt Schmid, Ditzingen-Schöckingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE84/00098, § 371 Date Oct. 19, 1984, § 102(e) Date Oct. 19, 1984, PCT Pub. No. WO84/04800, PCT Pub. Date Dec. 6, 1984
PCT Filed Apr. 27, 1984, Ser. No. 672,706
Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318459
Int. Cl.[4] F23Q *7/00*
U.S. Cl. 123—297 15 Claims

1. Device for fuel injection in combustion chambers of, in particular, selfigniting combustion engines with an injection nozzle and a subsequently switched incandescent wire which has a conduit surrounded by heatable walls through which the injection streams of the fuel can pass through substantially unhindered, characterized in that at the side of the combustion chamber at least two superimposed heating layers (**35,37**) are



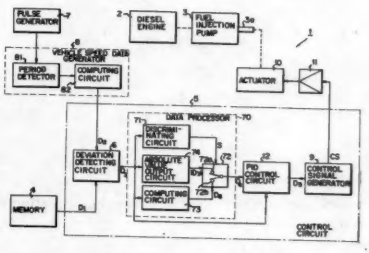
provided and separated from each other by insulation (**36**) in the conduit of the incandescent wire (**20**).

4,603,668

APPARATUS FOR CONTROLLING THE ROTATIONAL SPEED OF AN INTERNAL COMBUSTION ENGINE

Masahito Ueno, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Japan

Filed May 3, 1984, Ser. No. 606,700
Claims priority, application Japan, May 4, 1983, 58-77571
Int. Cl.[4] F02D *1/02, 31/00*
U.S. Cl. 123—352 4 Claims



1. An apparatus for controlling the rotational speed of an internal combustion engine by employing a closed loop, comprising:

a first means for producing first data indicative of a target engine speed;

a second means for producing second data indicative of the actual engine speed at each instant;

a deviation detecting means responsive to said first and second data for detecting the amount of deviation of the actual engine speed from the target engine speed and outputting a deviation signal corresponding to said deviation;

a first computing means for computing the absolute value of the deviation;

a second computing means for computing a predetermined function of N degrees ($N \geqq 2$) of the deviation;

means for discriminating the magnitude of the deviation;

a selecting means for selecting either the computed result from the first computing means or the result from the second computing means in response to the result of the discrimination of said discriminating means;

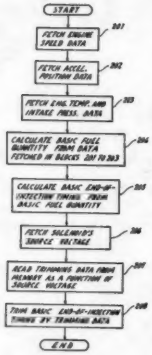
a generating means for generating a control signal in response to the output from said selecting means; and

means responsive to the control signal for adjusting a member for adjusting the speed of the internal combustion engine so that the deviation becomes zero.

4,603,669
FUEL INJECTION PUMP HAVING VOLTAGE VARIATION COMPENSATION

Eiji Takemoto; Masahiko Miyaki, both of Oobu; Hideaki Norimatsu, Toyohashi; Nobuhito Hobo, Inuyama; Yoshihiko Tsuzuki, Toyota, and Yoshimune Konishi, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 4, 1985, Ser. No. 688,995
Claims priority, application Japan, Jan. 10, 1984, 59-3287
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—357 10 Claims


START
FETCH ENGINE SPEED DATA
FETCH ACCEL. POSITION DATA
FETCH ENG. TEMP. AND INTAKE PRESS. DATA
CALCULATE BASIC FUEL QUANTITY FROM DATA FETCHED IN BLOCKS 201 TO 203
CALCULATE BASIC END-OF-INJECTION TIMING FROM BASIC FUEL QUANTITY
FETCH SOLENOID'S SOURCE VOLTAGE
READ TRIMMING DATA FROM MEMORY AS A FUNCTION OF SOURCE VOLTAGE
TRIM BASIC END-OF-INJECTION TIMING BY TRIMMING DATA
END

8. A fuel injection pump for an internal combustion engine, comprising:

an enclosure;

pump means including a plunger rotatingly and reciprocally movable in the enclosure to define a compression chamber of variable volume, said pump means coupling said compression chamber to a fuel inlet during an intake stroke of the plunger and connecting the compression chamber to a fuel outlet during a compression stroke of the plunger to thereby initiate injection of fuel to said outlet, said pump means being responsive to the speed of rotation of said engine to pressurize the fuel in said inlet;

means for detecting the speed of said engine;

a source of voltage having a tendency to vary;

soleniod valve means operable when a voltage is applied thereto from said source for providing a pressure relief action of the fuel in said compression chamber to terminate the injection of fuel;

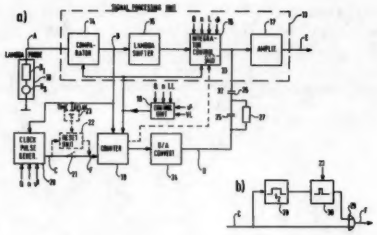
a memory storing trimming data in locations addressable as a function of the detected voltage and as a function of the detected engine speed; and

control means for detecting the voltage of said source and responsive to the initiation of the fuel injection for determining the basic timing at which the fuel injection is to be terminated, reading trimming data out of said memory as a function of said detected voltage and as a function of said detected engine speed, correcting the basic timing in accordance with said trimming data and applying the voltage of said source to said solenoid valve means at said corrected timing to thereby terminate the fuel injection.

4,603,670
METHOD OF AND DEVICE FOR LAMBDA-REGULATION OF FUEL MIXTURE FOR AN INTERNAL COMBUSTION ENGINE

Richard Bertsch, Asperg; Dieter Günther, Murr; Hans Schnürle, Walheim, and Ulrich Steinbrenner, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,742
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327156
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—440 17 Claims



1. A method of regulating air-fuel ratio in an internal combustion engine including a lambda probe for delivering a lambda signal indicative of proportion of oxygen in exhaust gas of the engine, and a signal processing unit connected to the lambda probe for processing the lambda signal according to an operational characteristic and delivering a control signal for an air-fuel ratio adjuster, the signal processing unit including means for adjusting between at least two changeovers of the lambda signal and after the expiration of an adjustable time period the operational characteristics of the signal processing unit in dependency on operational parameters of the engine such as load, rotary speed, and temperature, the method comprising the steps of comparing time intervals between consecutive change-overs of the lambda signal with successive monitoring time intervals t_1 during each of which the control signal has an increasing or decreasing course and, in the event of detecting an unchanged lambda signal after the expiration of a monitoring time interval t_1, discontinuing the course of the control signal at the end of each successive monitoring time interval the control signal and changing its magnitude in a jump to produce at the output of the signal processing unit a step-like course of the control signal until a change of the lambda signal is detected.

4,603,671
FUEL INJECTOR FOR AN INTERNAL COMBUSTION ENGINE

Toru Yoshinaga, Okazaki; Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio, and Yukihiro Natsuyama, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 10, 1984, Ser. No. 639,433
Claims priority, application Japan, Aug. 17, 1983, 58-149151; Jun. 25, 1984, 59-129098
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—467 11 Claims

1. A fuel injector for an internal combustion engine, which comprises:

a body having an axial bore;

a normally closed injection nozzle mounted to said body in alignment with said bore, said injection nozzle being of the differential pressure type including a pressure chamber and a needle valve;

injection fuel supply means in said body for supplying a high

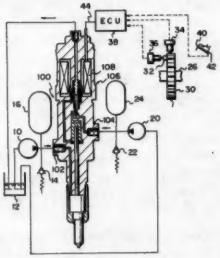
pressure fuel to said pressure chamber of said injection nozzle;

a power cylinder including a piston slidably received in said axial bore to define a working chamber therein, said piston being operative to be moved toward and away from said injection nozzle as said power cylinder is activated and deactivated;

working fuel supply means in said body for supplying a pressurized fuel to said working chamber of said power cylinder;

an electronically controlled solenoid valve placed in said working fuel supply means and selectively operable to close said wording fuel supply means, thereby precluding application of the fuel pressure in said working fuel supply means to said working chamber to deactivate said power cylinder upon energization of said solenoid valve and operable to open said working fuel supply means, thereby allowing transmission of said fuel pressure in said working fuel supply means to said working chamber to activate said power cylinder upon de-energization of said solenoid valve; and

actuating means operatively connected with said piston of the power cylinder for selectively rendering said injection nozzle opened to allow the high pressure fuel in said pressure chamber to be injected through said nozzle as said solenoid valve is energized to deactivate said power cylinder allowing the piston to move away from said injection nozzle, and rendering said injection nozzle



closed to terminate fuel injection as said solenoid valve is de-energized to activate said power cylinder causing the piston to be urged toward the injection nozzle;

the size and construction of said piston of the power cylinder being such that the force applied to said piston by the fuel pressure in said working chamber is substantially greater than the force applied to said actuating means by the fuel pressure in said injection fuel supply means or in said pressure chamber;

wherein said injection fuel supply means includes an injection fuel inlet (202) in said body for receiving an injection fuel pressurized at an ultra-high pressure and an injection fuel passage (227) in said body for communicating said inlet (202) with said pressure chamber, said working fuel supply means including a working fuel inlet (204) in said body for receiving a working fuel pressurized at a high pressure lower than said ultra-high pressure and a working fuel passage (236) in said body for transmitting the high pressure working fuel at said working fuel inlet (204) to said working chamber of said power cylinder, wherein said actuating means includes a valve seat (270) formed in said injection fuel passage (227) in alignment with and transversely of the axis of said piston and a needle valve (274) operated by said piston to become seated on said valve seat (270) to close the working fuel passage (236), and wherein said piston has a pressure receiving area larger than that of said needle valve (274) of said actuating means, the ratio of the pressure receiving area of said piston with respect to the pressure receiving area of said needle valve (274) of the actuating means being larger than the ration of the fuel pressure at said injection fuel inlet (202) with respect to the fuel pressure at said working fuel inlet (204).

4,603,672

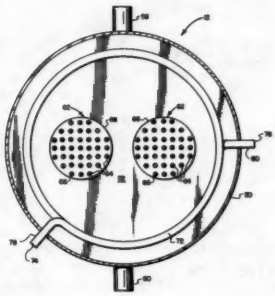
FUEL VAPORIZER FOR INTERNAL COMBUSTION ENGINE

R. W. Keller, 716 Moore La., Dewey, Okla. 74029

Continuation-in-part of Ser. No. 496,600, May 20, 1983. This application Jan. 9, 1985, Ser. No. 690,098

Int. Cl.[4] F02M *31/00*

U.S. Cl. 123—545 **3 Claims**



1. A fuel vaporizer assembly for vaporizing the fuel/air aerosol mixture produced by a carburetor for delivery to the intake manifold of an internal combustion engine, said fuel vaporizer assembly comprising a housing having sidewalls enclosing a heat transfer chamber, inlet and outlet fittings for circulating heat transfer fluid through said heat transfer chamber, flow dividing means received within said heat transfer chamber for dividing the fuel/air mixture produced by the carburetor into multiple fluid flow streams for delivery into the intake manifold, and an air circulation tube coiled within said heat transfer chamber, the coiled portion of said air circulation tube being exposed to said heat transfer fluid as it is circulated through the heat exchange chamber, said air circulation tube having a first open end portion adapted to receive ambient air flow and having a second open end portion for venting the ambient cooling air out of the air circulation tube and into the surrounding environment.

4,603,673

BREATHER DEVICE IN INTERNAL COMBUSTION ENGINE

Shin Hiraoka; Koji Asanomi, and Ryoji Abe, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 28, 1985, Ser. No. 706,643

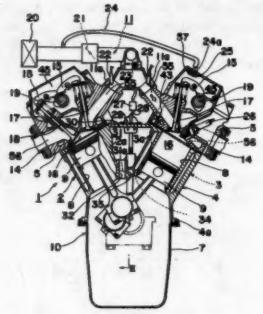
Claims priority, application Japan, Mar. 3, 1984, 59-41663; Mar. 3, 1984, 59-41664

Int. Cl.[4] F02B *25/06*

U.S. Cl. 123—573 **16 Claims**

1. In a crankcase ventilating system for a V-type, OHC internal combustion engine comprising a substantially hollow engine body structure having a pair of upwardly diverging cylinder banks and a downwardly facing opening, said engine body structure also having a pressure buffer chamber defined between opposed inner walls of the respective cylinder banks and a pair of opposite end walls with respect to the direction of an engine output shaft, said engine body structure further having a plurality of engine cylinders, defined in each of the cylinder banks, and a cam chamber defined therein at a top portion of each of the cylinder banks at a location opposite to the downwardly facing opening; an oil pan secured to the

engine body structure over the downwardly facing opening to define a crankcase; and intake system for the introduction of air into the engine cylinders through an air intake passage; first oil return passages defined in the engine body structure and communicating between each of the cam chambers and the buffer chamber; and a connecting passage means communicating between the buffer chamber and the crankcase, said connecting passage means comprising a blow-dry gas passage, having



one end in communication with the crankcase and the other end in communication with the buffer chamber, an end of said buffer chamber opposite the blow-by gas passage opening at a height above the bottom of said buffer chamber, and a second oil return passage having one end in communication with the crankcase and the other end opening at the bottom of and in communication with the buffer chamber, said other end ofthe blow-by gas passage being located at a level above the bottom of the buffer chamber.

4,603,674

GAS-DIESEL DUAL FUEL ENGINE

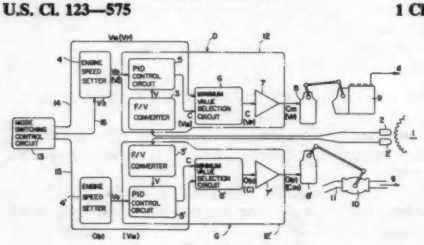
Mitsuo Tanaka, Ibaraki, Japan, assignor to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Jun. 16, 1982, Ser. No. 389,093

Claims priority, application Japan, Jun. 19, 1981, 56-89486[U]; Jun. 19, 1981, 56-89487[U]; Jun. 19, 1981, 56-89488[U]; Jun. 19, 1981, 56-89489[U]; Jun. 19, 1981, 56-89490[U]

Int. Cl.[4] **F02M** *39/00*

U.S. Cl. 123—575 **1 Claim**



1. In a gas-diesel dual fuel engine apparatus having a diesel engine, a diesel fuel supply system including a diesel fuel injection pump, a gaseous fuel supply system including gaseous fuel regulating valve, and a governing and controlling device for governing the speed of said engine and controlling the switch-over of the operation of said engine between a diesel fuel mode and a gaseous fuel mode; the improvement that said governing and controlling device comprises:

(a) first and second electronic governor means adapted to compare a speed signal representing the actual operating speed of said diesel engine with a set speed signal representing the set speed thereof and to perform a proportional plus integral plus differential operation on the basis of the difference therebetween for outputting respective control signals, according to the difference between said two speed signals, for the engine's diesel fuel mode and gaseous fuel mode;

(b) a pair of electric actuator means having respective power amplifier circuits and mechanically connected to said diesel fuel injection pump and said gaseous fuel regulating valve, respectively, for the actuation thereof;

(c) mode switching control means for controlling the switch-over of said governing and controlling device between the engine's diesel fuel operation mode and gaseous fuel operation mode, said mode switching control means being adapted to generate command signals for fully closing said gaseous fuel regulating value when the engine is in the diesel fuel operation mode and for operating said diesel fuel injection pump to feed said diesel engine with a predetermined amount of a diesel fuel as pilot injection fuel when the engine is in the gaseous fuel operation mode; and

(d) signal selecting means connecting said first and second electronic governor means and said mode switching control means to said pair of electric actuator means for selectively delivering said control signals and said command signals, said signal selecting means being controlled by said mode switching control means so that when the engine is in the diesel fuel operation mode, the appropriate control signal is delivered to said electric actuator means connected with said diesel fuel injection pump to operate said pump and the associated command signal is delivered to said electric actuator means connected with said gaseous fuel regulating valve to close said valve, while when the engine is in the gaseous fuel operation mode, the then appropriate control signal is delivered to said electric actuator means connected with said gaseous fuel regulating valve and the then associated command signal is delivered to said electric actuator means connected with said diesel fuel injection pump to operate said pump for the pilot injection;

(e) said signal selecting means comprising first and second minimum value selection circuits which connect said first and second electronic governor means to respective electric actuator means and each of which is adapted to compare the respective control signal from the corresponding electronic governor means with the associated command signal from said mode switching control means and to output only parts of said control signals lower than and equal to said command signals, and said mode switching control means comprising a voltage generating circuit which is adapted to generate a zero voltage signal, a pilot injection signal, a false set speed signal higher than said set speed signal and an upper limit voltage signal respresenting the upper limit of usable voltage, said voltage generating circuit being operable to input said zero voltage signal and said upper limit voltage signal to said second and said first minimum value selection circuits, respectively, when the engine is in the diesel fuel mode so that said gaseous fuel regulating valve is fully closed and said diesel fuel injection pump is operated according to said control signal from said first electronic governor means, said voltage generating circuit being further operable to input said upper limit voltage signal, said false set speed signal and said pilot injection signal to said second minimum value selection circuit, said first electronic governor means and said first minimum value selection circuit, respectively, when the engine is in the gaseous fuel mode so that said gaseous fuel regulating valve is operated according to said control signal from said second electronic governor means and said first electronic governor means outputs a control signal higher than said pilot injection signal by means of an integral action of the proportional plus integral plus differential operation to keep said diesel fuel

injection pump operating to feed said engine with the predetermined amount of pilot injection fuel.

4,603,675

SUPERVISORY AND MONITORING SYSTEM FOR AN ELECTRONICALLY CONTROLLED AUTOMOTIVE FUEL CONTROLLER, AND METHOD

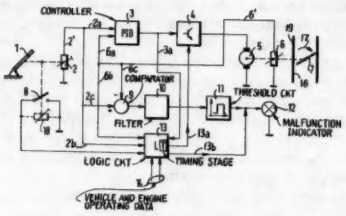
Erich Junginger, Stuttgart; Eberhard Schnaibel, Hemmingen, and Erich Schneider, Kirchheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 760,126

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430077; Mar. 21, 1985, 3510173

Int. Cl.[4] F02D *43/00*

U.S. Cl. 123—478 **20 Claims**



1. In an electronic control system for an automotive internal combustion engine (ICE) having

an electronically controllable fuel control element (7, 19; 207) for the ICE,

an operator controllable controller (1);

a command control transducer (2) coupled to the operator controllable controller (1) and providing a transduced command signal (2');

a positioning motor(4,5) coupled to the fuel supply control element (7, 207) for positioning thereof;

a fuel position transducer (6) coupled to the fuel control element (7, 207) and providing an actual fuel supply signal (6'); and

a servo control loop including a servo controller (3) coupled to receive as inputs the command signal and the actual fuel supply signal, and providing a control output coupled to the positioning motor (5) for positioning of the fuel control element,

the improvement comprising

a supervisory arrangement for supervising and monitoring the operation of said servo control loop and at least one of: said fuel control element, said command control transducer, said positioning motor, said fuel position transducer, and said operator controllable controller, comprising

a signal processing and logic circuit means (9, 10, 13) coupled (6b, 6c) to receive the actual fuel supply signal (6') and processing said signal, said circuit means including

limit means evaluating a characteristic of said actual fuel supply signal with respect to predetermined limits and providing an output when at least one of said predetermined limits is passed.

4,603,676

BOW DRAWBACK MECHANISM

Eugene H. Luoma, 1325 Normanna Rd., Duluth, Minn. 55803

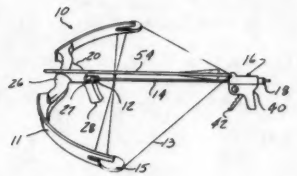
Filed Apr. 17, 1984, Ser. No. 601,231

Int. Cl.[4] F41B *5/00*; F41C *19/00*

U.S. Cl. 124—25 **2 Claims**

1. In a bow having a bow prod, and a bow string coupled to the ends of said prod, an elongated rod fixedly mounted at its forward end to the center of said prod and extending rearwardly from said prod, and a cocking mechanism including a housing mounted on said rod for movement longitudinally of said rod, said mechanism including trigger means operable to releasably couple said string to said housing;

the improvement wherein said cocking mechanism further comprises a cocking plate and a lock lever each having a rod-receiving aperture therethrough dimensioned to accommodate longitudinal sliding movement of said rod relative to the plate and lock lever when the plate and lock lever are disposed perpendicular to the longitudinal axis of said rod and to lock said plate and lock lever to said rod to prevent longitudinal sliding movement of said rod relative thereto when tilted relative to the rod axis, first abutment means in said housing establishing a normal rest position of said cocking plate wherein said cocking plate is perpendicular to the axis of said rod, an actuating lever pivotally mounted in said housing for pivotal movement between a normal position and an actuated position, said actuating lever being engaged with the rearward side of said cocking plate and being operable upon movement from said normal position to said actuated position to tilt said cock-



ing plate into locked engagement with said rod and to urge said cocking mechanism through one step of movement rearwardly relative to said rod and away from said bow prod, second abutment means in said housing establishing a normal rest position of said lock lever wherein said lock lever is tilted into locked engagement with said rod to prevent movement of said cocking mechanism relative to said rod, said second abutment means accommodating movement of said lock lever into perpendicular relation with said rod axis upon rearward movement of said cocking mechanism relative to said rod initiated by movement of said actuating lever into its actuated position and return of said locking lever to its normal rest position to prevent forward movement of said cocking mechanism relative to said rod whereby said cocking mechanism may be advanced rearwardly relative to said rod in step by step movement by successive movements of said actuating lever from its normal to its actuated position and further comprising:

lock button means operable to lock said lock lever in its normal rest position.

4,603,677

ORTHOGONAL DRESSING OF GRINDING WHEELS

Richard H. Gile, R.F.D. #1 Cold River Rd., North Clarendon, Vt. 05759, and Edward C. Bourgoine, 5 McKenzie Dr., Claremont, N.H. 03743

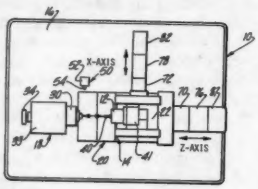
Filed Aug. 29, 1984, Ser. No. 645,373

Int. Cl.[4] B24B *53/00*

U.S. Cl. 125—11 R **6 Claims**

1. In a method for dressing a grinding wheel contour with a dresser having a working section, the steps of relatively traversing in contact the wheel contour and dresser by storing first and second sets of linear slide position data in memory means and providing said first and second sets to respective first and second slide drive means for generating a traversal path corresponding substantially to the wheel contour and rotating the dresser through selected angles during traversal to maintain a plane containing the dresser working section sub-

stantially othogonal to a plane containing a tangent to the wheel contour at dressed locations on the wheel contour by sensing the relative position of the dresser and wheel contour and the angle of the dresser and generating a third set of rotary



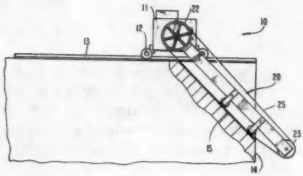
dresser position data for each of the first and second sets and providing said third set to rotary dresser drive means in coordination with each of the first and second sets of linear slide position data used to generate the traversal path.

4,603,678

BELT-CONFIGURED SAW FOR CUTTING SLOTS INTO STONE

Donald D. Fish, Bedford, Ind., assignor to W. F. Meyers Company, Inc., Bedford, Ind.

Filed Oct. 5, 1984, Ser. No. 657,833
Int. Cl.[4] B28D *1/08*
U.S. Cl. 125—21 **19 Claims**



1. A device for cutting a slot in stone comprising:
a main frame;
a jib movably mounted to said frame;
a pair of spaced apart and aligned sheaves being rotatably mounted and with at least one of said sheaves having lateral width and being mounted to said jib;
means on said frame and operably associated with said sheaves being operable to rotate same; and
a continuous flexible belt with a top and opposite sides and extending around and in driven engagement by said sheaves, said belt including a plurality of spaced apart abrasive cutting strips extending across said top and sides of said belt and being flush therewith, said sides defining the width of said belt which is sized greater than said lateral width allowing said one sheave to pass through a slot cut by said belt as said jib moves said belt through said slot.

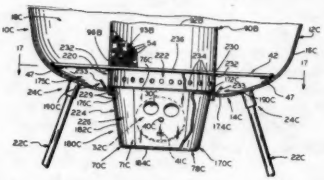
4,603,679

BARBEQUE GRILL WITH PAPER START FACILITY

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Continuation-in-part of Ser. No. 667,152, Nov. 1, 1984, Pat. No. 4,567,876, which is a division of Ser. No. 617,076, Jun. 4, 1984, Pat. No. 4,510,916, which is a continuation-in-part of Ser. No. 502,705, Jun. 9, 1983, abandoned. This application Jul. 25, 1985, Ser. No. 758,705
Int. Cl.[4] A47J *37/00*; F24B *3/00*
U.S. Cl. 126—25 B **12 Claims**

1. In a barbeque grill that includes a receptacle of open top bowl configuration having a central portion centered on same, at a central axis that extends normally of the plane of the receptacle top, with the receptacle defining a floor that is centered on the axis, and including a charcoal support grid and means for removably mounting same in the receptacle above and in operative overlying relation to the receptacle floor, and a food cooking grid and means for removably mounting same above and in operative overlying relation to the charcoal support grid, with the grids being respectively proportioned to be substantially centered on the central axis when mounted in the receptacle in their respective operative relations, and with the grids being disposed normally of the central axis when mounted in the receptacle in their respective operative relations, and means for mounting the receptacle for cooking purposes with the central axis of the receptacle substantially vertically disposed,
the improvement wherein said grill includes:
a tinder receiver located below the level of the charcoal support grid, when the latter is in its said operative relation, and comprising a tinder receiving chamber that is substantially centered on the central axis and that is proportioned transversely of said central axis to receive a tinder charge of predetermined size,
said tinder receiver defining an open container into which the tinder charge may be inserted into said tinder receiving chamber when the grids are removed from the receptacle for charging said tinder receiver with tinder,
said tinder receiver underlying the charcoal support grid across said container thereof when said charcoal support grid is in its operative relation,
a ring bonded to the underside of the charcoal support grid and to be disposed in substantial aligned relation with said container when said charcoal support grid is in its operative relation for forming an upper portion of said tinder chamber,



a combination charcoal receiver and distributing device that is discrete with respect to said grill and comprises an elongate annular sleeve having an open center extending therethrough and open upper and lower end portions defining a charcoal receiving chamber that is open at the upper and lower ends of same and has a central axis extending longitudinally of said sleeve,
said charcoal receiver device lower end being formed to rest on the charcoal support grid in substantially centered relation with said ring, when the charcoal support grid is mounted in the receptacle in its said operative relation,
said charcoal receiver device being proportioned transversely of its central axis to receive in said chamber thereof a charcoal charge that transversely of said charcoal receiver central axis approximates the corresponding dimensioning of said tinder receiver chamber adjacent the upper end thereof,
and means for venting ambient air exterior of said receptacle into said tinder chamber for providing for igniting and supporting combustion of a tinder charge received therein,
said charcoal receiver device having handle means fixed to said sleeve adjacent said upper end thereof for shifting said receiver device lower end relative to and over the charcoal support grid,
whereby, when the grill is to be used for charcoal food cooking, and on removal of both the grids from the receptacle to expose said tinder receiver bowl, the tinder charge may be applied to said tinder chamber and the charcoal grid returned to its operative relation to dispose said ring in substantially centered relation relative to said bowl, whereupon said charcoal receiver device may be rested on the charcoal

grid in substantial vertical alignment with said tinder receiver and with said lower end portion of said charcoal receiver device engaging the charcoal grid above said ring, a charcoal charge may be applied to said charcoal receiver device chamber through said charcoal receiving chamber upper end, and the tinder charge may be ignited through said venting means to effect ignition and burning of the charcoal charge by chimney effect through said charcoal receiver device chamber,

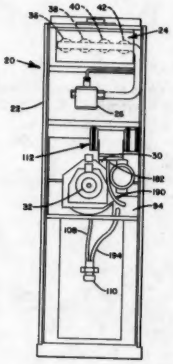
and after the charcoal charge is ignited, the user, facing the grill, may grasp said charcoal receiver device handle means to sufficiently lift same upwardly of the charcoal support grid and shift the lower end of the charcoal receiver device over the charcoal grid, for controlled discharge of the ignited charcoal from said device, and spreading of the charcoal, onto the charcoal grid, after which said charcoal receiver device is moved out of the grill and set to one side, and said cooking grid may be disposed in said operative relation thereof for food cooking purposes over the ignited charcoal.

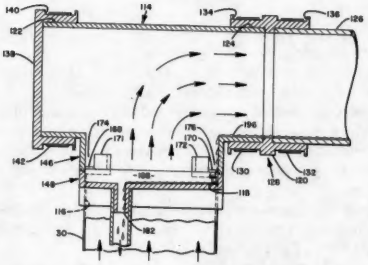
4,603,680

FURNACE INDUCER OUTLET BOX ASSEMBLY

Daniel J. Dempsey, and Kent L. Parker, both of Indianapolis, Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 10, 1984, Ser. No. 679,839
Int. Cl.[4] F24H *3/00*
U.S. Cl. 126—99 A **5 Claims**





1. In a furnace for raising the temperature of circulating air, comprising:

a heat exchanger assembly defining a flow path for a heating fluid and having an inlet and an outlet,

a heating means in proximity to said heat exchanger assembly inlet for supplying the heating fluid,

an inducer draft means having an inducer outlet for drawing the heating fluid through said flow path, said heat exchanger assembly outlet, and said inducer outlet, and

a vent for exhausting the heating fluid,

an inducer outlet box assembly, comprising:

a fluid transfer chamber being directly interconnected in fluid communication between said inducer outlet and said vent, said fluid transfer chamber including a plurality of differently directed openings being individually connectable to said vent, one of said openings being selectively connected to said vent, and

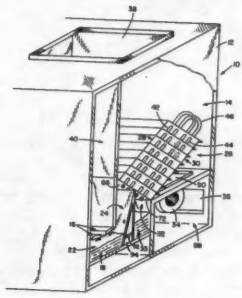
blocking means for selectively closing off the other ones of said chamber openings, whereby said vent can be selectively connected to said chamber in one of a plurality of different directions.

4,603,681

CONDENSING FURNACE WITH CORROSION SUPPRESSION

Lawrence G. Clawson, Dover, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 7, 1985, Ser. No. 785,116
Int. Cl.[4] F24H *3/02*
U.S. Cl. 126—110 R **16 Claims**



1. An apparatus for heating air, comprising:

a burner;

means coupled directly to said burner for raising the dew point of combustion products from said burner;

a condensing heat exchanger coupled to said dew point raising means, said condensing heat exchanger comprising a first upwardly inclined segment for receiving said combustion products from said raising means and a second segment coupled in series with said first segment; and

a blower for forcing air first across said second segment of said condensing heat exchanger for preheating said forced air and then across said first segment, said forced air being heated by extraction of both sensible heat and heat of condensation from both said first and second segments wherein condensate forming in said first segment flows downwardly in a direction opposite the flow of said combustion products.

4,603,682

THREE-DIMENSIONAL FIREPLACE INSERT

Daniel E. Maziasz, 27630 Parkview #412, Warren, Mich. 48092

Filed Nov. 19, 1984, Ser. No. 673,042
Int. Cl.[4] F24B *1/18*
U.S. Cl. 126—120 **6 Claims**

1. A three-dimensional fireplace insert adapted to be inserted in the opening of the firebox of a fireplace and to substantially seal said fireplace to substantially prevent the drawing of air therethrough, said fireplace insert having an opening adapted

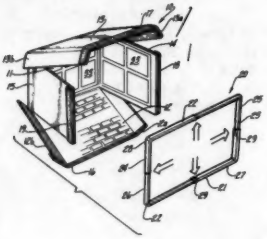
to be positioned adjacent the opening of said firebox and comprising, in combination:

a generally rectangular back wall which is adapted to be positioned in a generally vertical position within said firebox of said fireplace;

a bottom member which is in contact with said back wall adjacent the bottom of said back wall, said bottom member extending forwardly from said back wall and being adapted to substantially span the bottom of said opening of said firebox;

a top member which is in contact with said back wall adjacent the top of said back wall, said top member extending forwardly from said back wall and being adapted to substantially span the top of said opening of said firebox;

a first side member which is in contact with said back wall adjacent one side thereof and with said top member and said bottom member, said first side member extending forwardly from said back wall and being adapted to substantially span one of the sides of said opening of said firebox;



a second side member which is in contact with said back wall adjacent the other side thereof and with said top member and said bottom member, said second side member extending forwardly from said back wall and being adapted to substantially span the other of the sides of said opening of said firebox;

said back wall, bottom member, first side member and second side member being formed from a unitary blank of an organic sheetlike material by the folding of said unitary blank to permit a multiplicity of such fireplace inserts to be shipped and stored in compact stacks;

said fireplace insert defined by said back wall, bottom member, top member, and first and second side members being substantially impervious to the flow of air therethrough; and

an extensible frame disposed within said opening of said three-dimensional fireplace insert to permit said front edges to be accuratedly positioned with respect to said opening of said firebox.

4,603,683

FIREPLACE INSERT

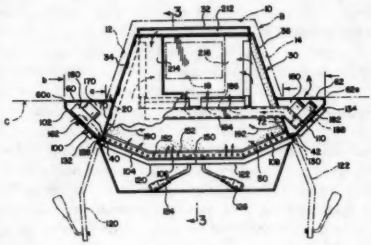
Richard D. Craver, Orrville, Ohio, assignor to Orrville Products, Inc., Orrville, Ohio

Continuation of Ser. No. 613,218, May 23, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,278

Int. Cl.[4] F24C *15/12*

U.S. Cl. 126—138 **1 Claim**

1. In a conversion insert for an existing fireplace cavity having a back wall and outwardly extending lateral walls defining an access opening with a preselected width, said insert having a sheet metal housing with a rear wall, outwardly diverging, spaced side walls extending outwardly from said rear wall, said walls defining a stove portion with a charging opening therebetween, and a face plate extending transversely outwardly from said spaced side walls of said housing to form a closure over said access opening when said insert housing is positioned in said fireplace cavity, said face plate having outboard, generally parallel edges spaced from each other, the improvement comprising: side walls of said housing extending outwardly from said rear wall a substantial distance beyond said face plate whereby said charging opening of said insert housing and a portion of said stove portion are spaced outwardly from said face plate whereby said charging opening is generally between two outer edges of said side walls and is as



large as said access opening of said fireplace cavity, and a pair of door members pivotally movable about the outer edges of said side walls, each of said door members including two generally planar portions with a fixed angle therebetween, said door members defining an outwardly protruding convex front wall having outwardly facing surfaces coplanar with said planar portions of said door members.

4,603,684

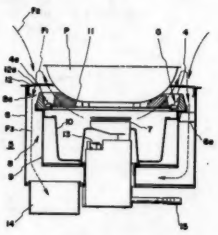
GAS COOKING DEVICE

Ozawa Kazuo, and Yoinara Saburo, both of Tokyo, Japan, assignors to Balibali System Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,576

Int. Cl.[4] F24C *15/20*

U.S. Cl. 126—299 R **3 Claims**



1. A gas cooking device comprising:

a table body;

a top plate being removably mounted on the table body and having a center and an inner periphery;

a combustion heater being disposed at the center of the top plate and having an outer housing with a center corresponding to the center of the top plate;

a circular gas burner provided at the center of the outer housing;

an inner housing removably disposed within the combustion heater so as to form an exhaust duct with the outer housing;

an annular outer holder being mounted on the inner housing and having an inner periphery and an outer periphery;

an annular inner roaster being supported over the circular gas burner by the outer holder and having an outer periphery;

stepped guide means, provided at the inner periphery of the

outer holder, for setting a vertical position of the inner holder at a selected one of the plurality of stepped levels;

groove means, provided along the outer periphery of the inner roaster, for mating with the stepped guide means of the outer holder;

an exhaust duct inlet provided at the outer periphery of the outer holder; and

a catch plate means, removably provided inside of the inner housing and below the circular gas burner, for receiving leaked food material;

wherein said inner periphery of the top plate extends over the exhaust duct inlet so as to be positioned inside of the outer periphery of the inner roaster when the inner roaster is used for directly cooking food material thereon;

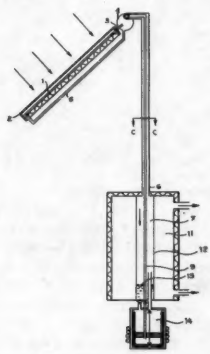
whereby outer gas is not drawn into the exhaust duct so that more smoke and steam instead will be effectively drawn into the exhaust duct.

4,603,685

SOLAR HEATING SYSTEM

Benoît Jean, Boucherville; Benoît Bergevin, and Fernand Rheault, both of Sainte-Julie, all of Canada, assignors to Institut National de la Recherche Scientifique, Canada

Filed Jun. 21, 1983, Ser. No. 506,542
Int. Cl.[4] F24J *2/32, 3/02*
U.S. Cl. 126—433 **12 Claims**



1. A solar water heating system operating in a closed circuit and making use of a change of phase of a working fluid as a heat transfer medium, comprising:

at least one collector to be exposed to sunlight for transmitting radiant solar energy to the working fluid in order to convert said fluid into a liquid-vapour mixture, said collecotr having an inlet and an outlet through which the liquid-vapour mixture exits;

a heat exchanger having an inlet and an outlet, said heat exchanger being of the type that allows free gravity flowing of the liquid that condenses therein;

a hot water storage reservoir connected to the heat exchanger to recover and store the heat extracted from the working fluid in said heat exchanger;

first piping means connecting the outlet of said at least one collector to the inlet of said heat exchanger, said first piping means including a phase-separator mounted thereon adjacent the outlet of said at least one collector to extract the liquid phase from the vapour phase in the liquid-vapour mixture exiting said collector;

second piping means for returning the liquid phase extracted in said phase separator to the inlet of said at least one collector whereby said collector is constantly wet and the heat exchanger is supplied with the working fluid in vapour phase only through said first piping means;

third piping means for connecting the outlet of the heat exchanger to the inlet of said at least one collector through the phase separator and said second piping means; and

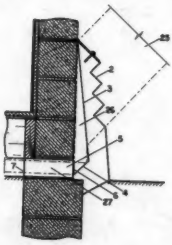
pumping means for returning the working fluid from the heat exchanger to said at least one collecotr through said third piping means, said pumping means being placed below the mean level of the liquid condensing in said heat exchanger to exclusively return the condensed liquid accumulated at the outlet of said heat exchanger to said phase separator through said third piping means wherein said pump comprises two concentric reservoirs spaced from each other so as to define a small volume therebetween, the internal reservoir being made of insulating material and the external reservoir being made of heat conducting material; said external reservoir being closed but connected to the outlet of said heat exchanger by means of a gravity feed pipe provided with an inlet unidirectional valve and also to the third piping means via an outlet unidirectional valve, said external reservoir being further provided with a vapour exhaust valve adapted to equilibrate the pressures between the gravity feed pipe and the pump during filling thereof; internal reservoir further enclosing a mechanism for sampling the liquid to be vaporized.

4,603,686

WALL-MOUNTED CONICAL BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Aug. 28, 1985, Ser. No. 770,126
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—440 **1 Claim**



1. A wall-mounted conical beam concentrator comprising in general an annular frusto-conical beam concentrator mounted to a concrete-block wall of a circular building, a course of curved glass blocks forming a base of the concrete-block wall, and a circular conical beam concentrator located in a crawl space located below a floor of the circular building; said annular frusto-conical beam concentrator, said curved glass blocks and said circular conical beam concentrator comprising the means by which diffused sunlight is reduced in size to a small concentrated beam which delivers heat to a central heating element located at the center of the circular building as means of heating the crawl space and said floor of the circular building; and comprising in particular;

an annular frusto-conical beam concentrator having four inset convex conical sections which receive diffused sunlight, said annular frusto-conical beam concentrator having a concave conical section which refracts and emits said diffused sunlight to form a concentrated vertical annular beam, said annular frusto-conical beam concentrator further having a concave conical reflective section which reflects said concentrated vertical annular beam to form a concentrated convergent lateral beam which is projected toward the center of the circular building;

a series of curved glass blocks forming the base course of said concrete-block wall, said curved glass blocks having a concentric outer cylindrical section and an inner cylindrical section which transmit said concentrated conver-

gent lateral beam through said crawl space toward the center of the circular building;

a circular conical beam concentrator having an outer annular component lens and an inner annular component lens; said outer annular component lens having a cylindrical section which receives and transmits said concentrated convergent lateral beam, said outer annular component lens having two opposed concave conical sections which refract and emit said concentrated convergent lateral beam to form two concentrated convergent conical beams; said inner annular component lens having two opposed convex conical sections which receive and transmit said two concentrated convergent conical beams, said inner annular component lens having two opposed concave conical sections which refract and emit said two concentrated convergent conical beams to form a second concentrated convergent lateral beam; and

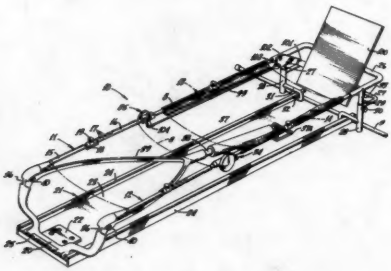
a heating element comprising a vertical metal rod mounted inside said inner annular component lens so as to intercept said second concentrated convergent lateral beam and absorb the heat thereof as means of heating said crawl space and said floor of the circular building.

4,603,687

CONTINUOUS PASSIVE MOTION ORTHOPEDIC DEVICE

Eugene C. Greenwood, 2956 B Peppertree La., Costa Mesa, Calif. 92626

Filed Aug. 8, 1983, Ser. No. 520,916
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 R **18 Claims**



1. A continuous passive motion orthopedic device comprising:

(a) an elongate base;

(b) thigh support means comprising a first pair of substantially horizontally disposed straight rails of telescopically adjustable length having soft material extending therebetween for the thigh to rest on, said rails having first and second ends, each of said first ends being attached to a substantially vertically disposed portion of dog leg configuration whose lowermost extremity is pivotally connected to one end of said base;

(c) calf support means comprising a second pair of substantially horizontally disposed straight rails of telescopically adjustable length having soft material extending therebetween for the calf to rest on, said rails having first and second ends, each of said first ends being pivotably interconnected to the corresponding second end of said first rails, the second ends of said second rails engaging said base and being supported thereby for movement along said base;

(d) linear drive means, one end of said drive means being connected to said base adjacent the end closest the second ends of said second rails, a drive fork having a narrow end connected to the other end of said drive means and a wide end pivotably connected to the vertically disposed portions associated with the first ends of said first pair of rails and

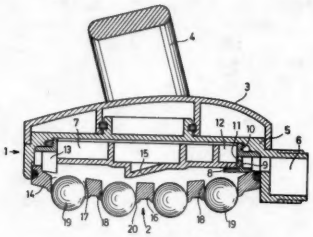
(e) means mounted at the intersection between said thigh and calf support means for generating an electrical command signal to signal said drive means to reverse direction, said signal generating means including adjustable means for setting two different angles between said calf support means and said thigh support means where said drive means will be signalled to reverse direction.

4,603,688

MASSAGE APPARATUS

Helmut Roming, Linberg 27, D-7230 Schramberg 11, Fed. Rep. of Germany

Division of Ser. No. 339,148, Jan. 13, 1982, Pat. No. 4,498,493.
This application Dec. 21, 1984, Ser. No. 684,612
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1981, 3101538
Int. Cl.[4] A61H *15/00*
U.S. Cl. 128—37 **15 Claims**



1. A massage apparatus, comprising:

a casing having a water turbine, the casing having means for attachment to a supply of water for rotating the turbine about an axis, the casing having a working surface with a plurality of openings arranged laterally around said axis, the openings permitting passage of water, the turbine having at least one eccentric projection with an inclined surface directed toward the working surface; and,

a plurality of spherical massage bodies mounted at the openings in the working surface and laterally spaced around the axis defined by rotation of the turbine, the massage bodies being captive in the working surface and individually moveable over a stroke parallel to said axis, the stroke including a range of positions inwardly from an outermost position at which the massage bodies substantially seal the openings from passage of the water, the bodies being urged outwardly by water pressure and urged inwardly by contact with a body part to be massaged whereupon the water passes the massage bodies, and the massage bodies being axially driven outwardly by contact with the eccentric projection when moved inwardly from said outermost position, the massage bodies cooperating directly with the inclined surface of the at least one eccentric projection of the turbine.

4,603,689

PATIENT OPERATED DEVICE AND METHOD FOR APPLYING TRACTION TO THE LOWER BACK VERTEBRA OF A PATIENT IN A SEATED POSITION

John A. Horner, 211 E. Grove St., Kawkawlin, Mich. 48631

Filed Mar. 15, 1985, Ser. No. 712,189
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—75 **9 Claims**

1. In a patient operated device for applying traction to the lower spinal area of a patient in a seated position in a chair, the combination with the chair comprising:

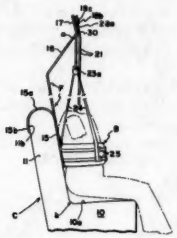
a. an elongate, generally vertically extending frame having a generally vertically rearwardly inclined first portion adapted to bear against the rearwardly inclined vertical backrest of a chair having also a generally horizontal seat, a second portion extending vertically forwardly from the upper end of the backrest to a locus spaced above the backrest and approximately vertically above the rear edge of the seat, and a third section extending upwardly from said second section generally at said locus;

b. said frame having a rearwardly projecting downwardly open, generally hook-shaped section adapted to fit over the upper end of the backrest including a portion extending downwardly along the rear surface of the backrest opposite the vertically rearwardly inclined portion;

c. an intermediate support arm movable vertically with respect to said frame;

d. a padded belt adapted to be worn around the lower thoracic area of the patient;

e. flexible strips connecting the belt and support arm;



f. a pulley system supported by the said third portion of the frame;

g. a cable trained around said pulley system and connected to said support arm, the cable having a free end adapted to hang down from the pulley system so as to be graspable by the seated patient whereby it can be pulled downwardly to raise the buttocks vertically off the seat such that the weight of the torso is substantially wholly supported by the belt while the belt and spinal area engage the backrest and the front of the seat engages the legs;

h. and a pair of spring biased, spaced apart, pivotally mounted, releasable grippers mounted on said frame at said locus on opposite sides of said free end of the cable, said grippers being biased to pivot toward said cable to cable gripping position but being offset mounted to be spreadable with a downward movement of said cable along said frame, said frame serving as a guide surface for said cable between said grippers and the cable being removable from said grippers with a forwarding movement thereof to free the cable from gripper locked position.

4,603,690

SLIDING PIVOT KNEE JOINT

Solomon L. Skeen, P.O. Box 644, Opp, Ala. 36467

Filed Jul. 10, 1984, Ser. No. 629,559

Int. Cl.[4] A61F *5/00*

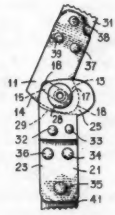
U.S. Cl. 128—80 C **2 Claims**

1. A joint structure for use in knee braces and the like, comprising:

upper and lower joint elements; the lower joint element having a ramp member and a pair of furcations, both of the furcations overlapping a concave edge surface of the ramp member; the upper joint element having a head which is received between the furcations for articular motion of the upper joint element relative to the lower joint element; the forward portion of the lower edge surface of the head and said concave edge surface having approximately the same radius of curvature;

the upper joint element having an elongated slot formed within said head; the lower joint element having a pin passing through said slot and connecting said joint elements together, the elongated slot having lower and upper end portions adapted to engage said pin and a central portion having curved edge surfaces with approximately said radius of curvature; the central portion being dimensioned to permit said pin to slide between said slot end portions as said joint elements rotate with respect to each other at the same time the forward portion of the lower edge surface of the head engages the concave edge surface of the ramp member, the pin moving within the slot toward the upper end portion thereof as the angle between the longitudinal axes of the joint elements is increased; the joint structure being locked with respect to any further increase in the angle between the longitudinal axes of the upper and lower joint elements when the pin engages the upper end portion;

the head defining a rearwardly projecting lobe, the outer edge surface of the lobe having a substantially smaller radius of curvature than does the concave edge surface of the ramp member; the lower end portion of the slot being arranged on said upper joint element so that when the pin engages, said lower end portion, the pin is positioned at approximately the center of curvature of the outer edge surface of the lobe; the pin being the center of rotation about which the joint elements can rotate as the angle



between their longitudinal axes is decreased beyond a limiting angle which is attained when the pin engages the lower end portion of the slot, the limiting angle being substantially less than 180° and being within the range of angles between said longitudinal axes which are traversed as the upper and lower joint elements undergo motions which are encountered when a wearer of the joint structure is using it to approximate a normal walking gait; the upper joint element being rotatable about the pin to decrease the angle between said longitudinal axes even when the lower joint element is stationary once the angle between said longitudinal axes is less than the limiting angle, thereby facilitating a wearer's actions in sitting down;

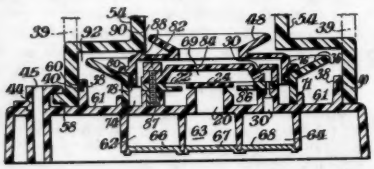
the forward portion of the lower edge surface being curved downwardly and rearwardly at approximately the same angle to the longitudinal axis of the upper joint element as is the concave edge surface to the longitudinal axis of the lower joint element, so that sliding contact is maintained between substantial sections of the forward portions of the lower edge surface and the concave edge surface when the angle between the longitudinal axes of the joint elements is greater than said limiting angle, thereby preventing an accidental rotation of the joint elements toward each other when the contiguous edge surfaces of the joint elements are not under compression.

4,603,691

PULMONARY VENTILATOR-BELLOWS-ASSEMBLY KIT

Tibor Rusz, 761 West St., Pittsfield, Mass. 01201

Filed Dec. 24, 1984, Ser. No. 685,906
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—205.15 12 Claims



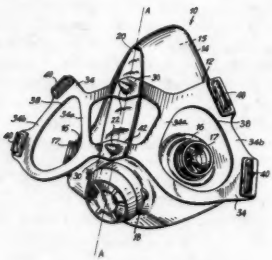
1. A pulmonary ventilator-bellows assembly kit comprising:
(a) a base adapted for being supported on a horizontal platform, said base having an annular main-bellows-mounting portion extending upwardly from a top surface of said base;
(b) a substantially cylindrical main bellows, the open end thereof adapted for being fitted and sealed to said bellows-mounting portion of said base;
(c) a cylindrical main housing having a closed top portion and open bottom portion, said housing being adapted for mounting and sealing to a peripheral region of said base, and for enclosing said main bellows when said main bellows is fitted to said main-bellows-mounting portion of said base;
(d) an annular thin-walled small-bellows adaptor that is adapted for being inserted, seated and sealed to said base within said annular main-bellows-mounting portion;
(e) a substantially cylindrical small-bellows the open end thereof being adapted for being fitted and sealed to said small bellows adaptor; and
(f) a small housing having a closed cylindrical top portion of smaller diameter than that of said main housing, and an enlarged open bottom portion having an inside diameter equal to that of said main housing adapted for mounting and sealing said small housing to said base peripheral region and, for enclosing and locking in place said small bellows when said adaptor is mounted and sealed to said base and said small bellows is fitted to said adaptor.

4,603,692

YOKE FOR THE HARNESS OF A RESPIRATOR

Edward N. Montesi, Barrington, R.I., assignor to Siebe North, Inc., Charleston, S.C.

Filed May 21, 1984, Ser. No. 612,576
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—207.11 6 Claims



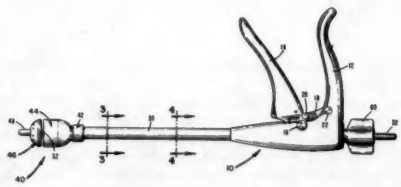
1. A yoke for a respirator, comprised by:
a unitary lamina of stiff plastics material including;
an apertured, substantially trapesoidal medial portion of said lamina for attachment to a front face of a respirator face piece;
apertured substantially trapesoidal wing portions provided by said lamina and extending laterally of said medial portion symmetrically about a line bisecting said medial portion;
hinge portions provided by said lamina and interconnecting the respective said wing portions with said medial portion, said hinge portions being comprised by portions of said lamina of lesser thickness than the remainder of said lamina; and,
strap connection means located at corners of said wing portions remote from said medial portion.

4,603,693

INSTRUMENT FOR CIRCULAR SURGICAL STAPLING OF HOLLOW BODY ORGANS AND DISPOSABLE CARTRIDGE THEREFOR

Robert L. Conta, and Harvey N. Wallach, both of Trumbull, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 138,877, Apr. 10, 1980, abandoned, which is a division of Ser. No. 967,421, Dec. 7, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,965, May 26, 1977, abandoned. This application Dec. 7, 1981, Ser. No. 328,068
Int. Cl.[4] A61B *17/11*
U.S. Cl. 128—305 5 Claims



1. A two-part disposable surgical stapling cartridge assembly for use with an actuator having first, second, and third relatively movable actuator members for stapling an annular pattern in hollow body organs, comprising:
(1) an anvil-carrying part including (a) a dish-shaped body, (b) an anvil having an annular array of staple-clinching grooves mounted in said dish-shaped body, and (c) first means for removably mounting said dish-shaped body on said first actuator member; and
(2) a staple-carrying part including (a) a staple guide body defining (i) an annular array of staple-holding grooves and (ii) second means for removably mounting said staple-carrying part on said second actuator member, said second means being the sole means associated with said cartridge assembly for retaining said staple-carrying part on said actuator, (b) a staple ejector means movably mounted in and permanently retained by said staple guide body and being contactable by said third actuator member when said staple guide body is mounted on said second actuator member for ejecting staples from said staple-holding grooves in response to actuation of said third actuator member, (c) annular knife means concentric with and inside said annular array of staple-holding grooves, said annular knife means being permanently mounted on said staple ejector means for movement with said staple ejector means for severing said hollow body organs inside the annular array of staples ejected from said staple-holding grooves, and (d) first and second mutually opposed and interfitting detent means respectively defined by said staple guide body and said ejector means for maintaining said staple ejector means and said annular knife means in a predetermined position in said staple guide body

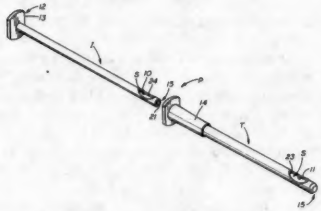
prior to mounting said staple-carrying part on said second actuator member and for preventing accidental relative movement of said staple guide body and said staple ejector means of the type which would cause ejection of the staples from said staple-holding grooves, said detent means being disengaged when said staple guide body is mounted on said second actuator member to allow said third actuator member to move said staple ejector means.

4,603,694

ARTHROSCOPIC SHAVER

C. Ray Wheeler, St. Joseph, Mo., assignor to Richards Medical Company, Memphis, Tenn.

Filed Mar. 8, 1983, Ser. No. 473,242
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—312 **10 Claims**



1. A surgical instrument for cutting tissue, the instrument comprising:

an outer tube sized and shaped for insertion through a puncture in the flesh of a body, the outer tube having a side-facing opening therein for the entrance of tissue to be cut;

an inner tube fitted in the outer tube and adapted to rotate relative to the outer tube, the inner tube including a side-facing opening defining a blade adapted to co-act in cutting action with a cooperating edge of the side-facing opening of the outer tube;

the inner tube further including a longitudinal opening on its proximal end adapted for connection to a suction device for drawing fluid and cuttings into the openings and for drawing the fluid and cuttings through the instrument;

means for connecting the inner tube to a drive motor for continuously rotating the inner tube relative to the outer tube so that the blade on the inner tube is moved past the cooperating edge of the side-facing opening in the outer tube;

bearing means at the distal end of the inner and outer tubes for supporting and aligning the inner tube relative to the outer tube;

the bearing means including a first bearing surface projecting into the outer tube and forming an annular space that tapers inwardly away from the inner side surface of the outer tube; and

a second bearing surface at the distal end of the inner tube shaped and dimensioned to overlap and cooperate with the first bearing surface and extend around substantially the entire distal end of the inner tube.

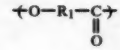
4,603,695

USE OF MOLDED POLYMERIC MATERIAL FOR PREVENTING ADHESION OF VITAL TISSUES

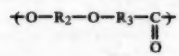
Yoshito Ikada; Shokyu Gen; Yasuhiko Shimizu, all of Uji; Koichi Tamura; Tatsuo Nakamura, both of Kyoto; Sosuke Kimura, Hiroshima; Tsuneo Cho, Hiroshima; Hideki Tadokoro, Hiroshima, and Kazuaki Hori, Hiroshima, all of Japan, assignors to Japan Medical Supply Co., Ltd., Hiroshima, Japan

Filed Jun. 29, 1984, Ser. No. 626,545
Claims priority, application Japan, Jul. 5, 1983, 58-122643
Int. Cl.[4] A61B *17/04*
U.S. Cl. 128—334 R **20 Claims**

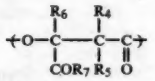
1. A method for preventing adhesion between vital tissues which comprises placing between said tissues a molded material consisting essentially of a biodegradable and absorbable polymer selected from the group consisting of a polyester having repeating units of the formula:



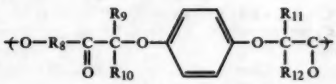
in which R_1 represents a C_1 to C_{10} divalent alkylene group,
a polyester having repeating units of the formula:



in which each of R_2 and R_3 represents a C_1 to C_{10} divalent alkylene group,
a polyester having repeating units of the formula:



in which each of R_4, R_5, and R_6 represents hydrogen or a lower alkyl group, and R_7 represents OR_7' or $NR_7''R_7'''$ in which each of R_7', R_7'' and R_7''' represents hydrogen or a lower alkyl group,
a polyester having repeating units of the formula:



in which R_8 represents a C_1 to C_{10} divalent alkylene group, and each of R_9, R_{10}, R_{11} and R_{12} represents hydrogen or a lower alkyl group,
collagen, an amino acid polymer or chitin.

4,603,696

LEAD CONNECTOR

Thomas E. Cross, Jr., St. Francis, and Gerald J. Hults, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

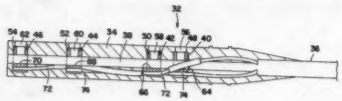
Filed Feb. 14, 1985, Ser. No. 701,466
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 P **6 Claims**

1. A connector system for connecting a medical electrical lead to a medical electrical stimulator, comprising:

a first connector member having a first predetermined number of electrical connector surfaces, mutually insulated from one another, mounted linearly along said first connector member such that each of said predetermined number of contact surfaces is spaced a first predetermined

distance from the contact surfaces immediately adjacent thereto and such that said first predetermined number of connector surfaces extends over a second predetermined distance on said first connector member and wherein said first predetermined number is greater than two; and

second connector member means for slideably engaging said first connector member, said second connector member means including a second predetermined number of electrical contact surface means, arranged linearly along said second connector member means, for contacting selected ones of said first predetermined number of electrical contact surfaces on said first connector member when said first connector member is slideably engaged with said second connector means, said second predetermined number being at least equal to said first predetermined number,



said second connector member means further comprising first and second conductors, wherein each of said second predetermined number of connector surface means is coupled to only one of said first and second conductors and such that each of said second predetermined number of connector surface means is coupled to a different one of said first and second conductors from the connector surface means immediately adjacent to it, said second predetermined number of electrical connector surfaces spaced from one another such that each connector surface means is spaced a multiple of said first predetermined distance from each adjacent connector surface means and such that each connector surface means is spaced a distance greater than said second predetermined distance from any other connector surface means coupled to the same one of said first and second conductors.

4,603,697

SYSTEM FOR PREVENTING OR TREATING OPEN ANGLE GLAUCOMA AND PRESBYOPIA

William Kamerling, 423 W. Clements Bridge Rd., Barrington, N.J. 08007

Filed Jan. 7, 1985, Ser. No. 689,124
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—421 **18 Claims**

1. Body implantable system for the prevention or treatment of open angle glaucoma by eletrical stimulation of the ciliary muscle of the eye, comprising means for developing an electrical stimulation signal, and means connected to said last-mentioned means for delivering said signal to the longitudinal fibers of the ciliary muscle.

4,603,698

SYSTEM OF PODIATRIC APPLIANCES INDEPENDENTLY ADJUSTABLY SECURABLE ON INNER SOLE-LIKE BASE PLATE

Jaime Guttmann Cherniak, Ave. Tiradentes No. 10, Centro Commercial Dalyn, Ens. Naco, Santo Domingo, Dominican Republic

Filed May 9, 1984, Ser. No. 608,562
Int. Cl.[4] A61F *5/14*
U.S. Cl. 128—603 **18 Claims**

1. A podiatric appliance system, comprising:

a stiffly flexible base plate having an outline approximating that of at least a portion of the length and width of a foot sole, in the manner of a conventional footwear inner sole;

said base plate being more flexible about a series of longitudinally spaced, transversally extending axes thereof, than about longitudinally extending axes thereof;

said base plate including a plurality of strips of stiffly flexible material, each of such a thickness as to be flexible about its own longitudinal axis each not more than six millimeters wide arranged with close spacing of less than one millimeter from strip to strip, in a series in a single layer, with each strip extending transversally of the base plate; and

means flexibly uniting all of said strips, said uniting means being a layer of flexible material to which each of said strips is secured;

means providing a tangible grid of mounting sites on said base plate, extending in a uniform, predetermined pattern on all of at least one face of said base plate;

said mounting sites comprise closely spaced respective small, round holes provided vertically through each of said strips;

each said strip having said holes provided in at least one row of uniformly spaced holes, each of which rows extends lengthwise of the respective strip, which equates to transversally of the base plate;

a podiatric appliance constructed and arranged to have an operative portion thereof positioned in engaging relation with a respective portion of a foot of a wearer;

a mounting base provided on said podiatric appliance;

means providing at least two sets of spatially separated tangible securement sites on said mounting base of said podiatric appliance, said securement sites being constructed and arranged to be selectably juxtaposable in registry with a respective number of said mounting sites on said base plate so that such juxtapositions may be matched to a prescription, recorded or reported; and

respective securement means constructed and arranged for securing said mounting base to said base plate at each place where a said securement site is juxtaposed in registry with a said mounting site;

said securement means comprising a plurality of small U-shaped wires round in transverse cross-section and having respective central portions embedded in said mounting base of said podiatric appliance, each wire having two end portions protruding from said mounting base nearer to the perimeter than to the center of such mounting base, including one end portion at each respective securement site; and

said mounting sites being constructed and arranged to have

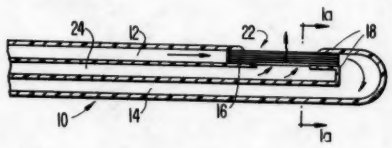
respective ones of said wire protruding end portions inserted downwardly therethrough and bent under said base plate for securing said podiatric appliance on said base plate.

4,603,699

APPARATUS AND METHOD FOR MEASURING OSMOTIC PRESSURE IN SITU

Jacques M. Himpens, P.O. Box 608, North White Plains, N.Y. 10603

Filed Nov. 20, 1984, Ser. No. 673,290
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—632 **7 Claims**



1. Apparatus for use in a system for measuring osmotic pressure in a bloodstream, said apparatus comprising:

catheter means for insertion in a subject's bloodstream, said catheter means having first and second lumens therein and a port adapted to permit contact of the interior of said catheter with said bloodstream;

at least one tube of a material that is semi-permeable to a fluid of said bloodstream, said tube fluidly connecting said first lumen with said second lumen and extending across said port, the ends of said tube being connected to said first and second lumens, respectively, in airtight and watertight seals; and

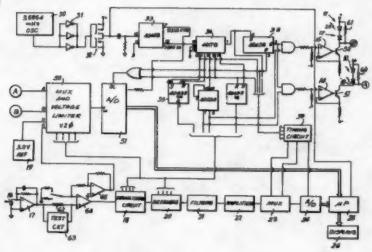
a pressure sensor means for measuring the pressure in said first lumen.

4,603,700

PROBE MONITORING SYSTEM FOR OXIMETER

Robert A. Nichols, and David R. Tobler, both of Thornton, Colo., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Dec. 9, 1983, Ser. No. 559,734
Int. Cl.[4] G01N *33/16*
U.S. Cl. 128—633 **9 Claims**



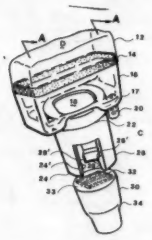
7. A method for monitoring an oximeter wherein at least two light emitting devices of different wavelengths are alternately energized, the light therefrom being received by a light detector for application to a processing circuit for determining the constituents of a tissue between said light emitting devices and light detector, the oximeter including timing means for controlling said light emitting devices, light detector and processing circuit; said method comprising sensing the voltages across said light emitting devices to provide a plurality of first test values at signal valid times, assigning integer values to said test values, in accordance with their amplitude, to provide a plurality of range values, combining said range values, and testing said combined range values to indicate the operability of said oximeter.

4,603,701

STAND-OFF DEVICE WITH SPECIAL FLUID

James N. Chen, Chelmsford, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 16, 1983, Ser. No. 562,307
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **14 Claims**



1. A stand-off device for coupling an acoustic transducer to an animal body having a given acoustic impedance Z_B, comprising:

means defining a chamber having a pliant diaphragm at a side thereof that conforms to the contours of a patient's body, said diaphragm having inner and outer surfaces and having an acoustic impedance Z_D,

means for coupling another side of said chamber to a transducer

liquid including cesium chloride having a given acoustic impedance Z_L contained in said chamber so as to conduct acoustic waves from a transducer when coupled to said chamber to said diaphragm,

the reflection coefficients $(Z_D-Z_L)/(Z_D+Z_L)$ and $(Z_B-Z_D)/(Z_B+Z_D)$ and the thickness of the diaphragm being such that acoustic waves from said transducer that are reflected at the outer and inner surfaces of said diaphragm cancel each other to such an extent that the energy reflected toward the transducer is within 6 db of the energy reflected from these surfaces when the reflection coefficients are equal and the thickness of the diaphragm is precisely an odd number of quarter-wavelengths of the central frequency of the transducer with which the stand-off device is to be used.

4,603,702

CIRCUIT FOR MONITORING CONTACT OF ULTRASOUND TRANSDUCER WITH PATIENT

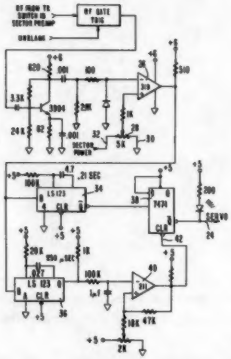
Juin-Jet Hwang, Mesa; Ronald E. McKeighan, Tempe, and Paul M. Jaeger, Mesa, all of Ariz., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.

Filed Mar. 11, 1985, Ser. No. 710,358
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **1 Claim**

1. A circuit for monitoring contact of an ultrasound transducer with a patient and for generating an output signal which can be used to operate a timer which measures the amount of time said patient has been exposed to ultrasound energy comprising:

(a) a medical ultrasound scanner of the type comprising an ultrasound transmitter, an ultrasound receiver, and ultrasound scanhead, said ultrasound scanhead being a mechanical scanhead of the type in which at least one ultrasound transducer is mechanically moved within said scanhead and ultrasound energy is transmitted out of said scanhead through an endcap;

(b) monitoring means associated with said ultrasound receiver for monitoring a signal representative of the coupling of said ultrasound scanhead with said patient and for generating an output signal which indicates that said ultrasound transmitter is transmitting ultrasound energy into a patient, said monitoring means being comprised of a circuit which measures the amplitude of any reverberation echo from the endcap of said scanhead by measuring the intensity of the signal which is received by said ultrasound



receiver at a time corresponding to the time it takes for ultrasound energy to travel from said transducer to said endcap and back, and in which said monitoring means compares the intensity of said reverberation echo to a predetermined threshold value; and

(c) means associated with said monitoring means for controlling the mechanical movement of said scanhead when said monitoring means detects a reverberation echo which exceeds said threshold value.

4,603,703

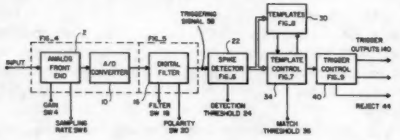
METHOD FOR REAL-TIME DETECTION AND IDENTIFICATION OF NEUROELECTRIC SIGNALS

Kevin C. McGill, Palo Alto, and Leslie J. Dorfman, Stanford, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 13, 1984, Ser. No. 599,889

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—731 **21 Claims**



1. A method of real time analysis of neuroelectrophysiological signals for detecting and identifying action potentials comprising the steps of digitally filtering the signals using a low-pass differentiator and automatically detecting and identifying the recurring spikes in the filtered signal.

4,603,704

ELECTRODE FOR MEDICAL APPLICATIONS

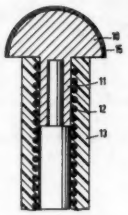
Konrad Mund, Uttenreuth; Helmut Freller, Roethenbach, and Friedrich Hoerauf, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,832

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1983, 3300668

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—784 **16 Claims**



1. An electrode for medical applications comprising an electrically conductive carrier material and a porous layer defining an active region, said porous layer being of a material comprised of at least one compound selected from the group consisting of a carbide, nitride or carbonitride of at least one of the metals titanium, vanadium, zirconium, niobium, molybdenum, hafnium, tantalum or tungsten, said porous layer having a layer thickness between one micron and one hundred microns.

4,603,705

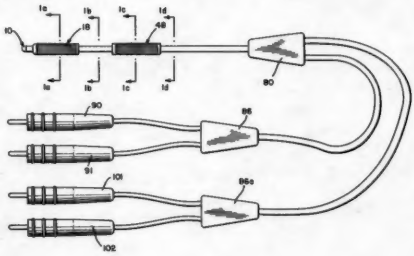
INTRAVASCULAR MULTIPLE ELECTRODE UNITARY CATHETER

Vernon L. Speicher, Leechburg, and Stanley M. Bach, Jr., Pittsburgh, both of Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Filed May 4, 1984, Ser. No. 606,948

Int. Cl.[4] A61N *1/05*

U.S. Cl. 128—786 **10 Claims**



1. An intravascular catheter electrode assembly adapted to operate in a pacing, a cardioverting and a plurality of sensing modes comprising:

an elongated electrically insulated catheter body having a distal end;

a first electrode positioned on said distal end of said catheter body;

a second electrode positioned on said catheter body proximally of said first electrode and spaced a predetermined distance from said first electrode;

a third electrode positioned on said catheter body between and spaced from said first and second electrodes;

first connecting means having a first pair of input/output connectors for configuring said first and third electrodes as a pacing electrode pair during said pacing mode and a first sensing electrode pair during one of said plurality of sensing modes; and

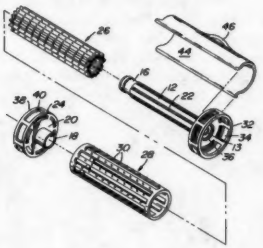
second connecting means having a second pair of input/output connectors for configuring said second and third electrodes as a second sensing electrode pair during a second of said plurality of sensing mode and a cardioverting electrode pair during said cardioverting mode.

4,603,706

HAIR CURLER

Richard Caruso, 7801 Montgomery Ave., Elkins Park, Pa. 19117

Filed Mar. 4, 1983, Ser. No. 471,981
Int. Cl.[4] A45D *2/26*
U.S. Cl. 132—41 **17 Claims**



1. A hair curler comprising:

a tubular core having a plurality of slots axially disposed around a circumference of the core, the core being open at one end and closed at the other end;

a circular extension disposed at each end of the core, the extension having a diameter greater than the diameter of the core and being coaxial with the core, a length of the extension being substantially less than a length of the core;

a tubular porous substrate surrounding the core and being between the extensions and being in contact with the core; and

a tubular casing having a plurality of slots axially disposed around a circumference of the casing, the slots terminating proximal ends of the casing, the casing surrounding the substrate between the extensions and being in contact with the substrate.

4,603,707

PURGE BLOCK FOR GAS SYSTEMS

Roger J. Gregoire, and Bruce Huling, both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 2, 1983, Ser. No. 519,639
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—557 **21 Claims**

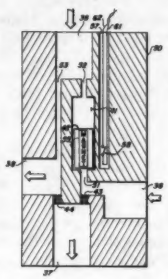
1. An apparatus comprising:

first, second, third, and fourth port means;

fluid conducting means for interconnecting said port means;

said first and second port means serving as fluid inlet ports and said third or fourth port means serving as fluid outlet ports; and

said conducting means interconnecting said first and second ports comprising flow sensing means for detecting which of said first and second ports is at a higher pressure than the other said conducting means also interconnecting said



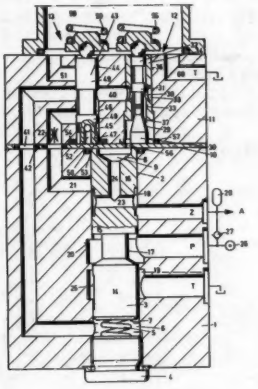
second and third ports, said third and fourth ports, and said first and fourth ports.

4,603,708

SHUT-OFF VALVE

Hans-Peter Altmann, Wülfrath, Fed. Rep. of Germany

Filed Sep. 13, 1984, Ser. No. 649,943
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334189
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—116 **8 Claims**



1. A shut-off valve for connecting an inlet feeding a hydraulic system to an outlet when an upper switching pressure is reached in the hydraulic system and for breaking this connection when a lower switching pressure is reached in the hydraulic system, comprising

(a) a main control-piston (3) which, in a first switching position, breaks the connection between the inlet (P) and the outlet (T) and, in a second switching position, makes the said connection;

(b) a restoring spring (5) urging the main control-piston (3) towards the first switching position;

(c) a first effective area (7), on the main control-piston (3) in a first control-chamber (6), which is acted upon by a control-pressure, the value thereof being controlled by a first pilot valve (12) and a second pilot valve (13) and which loads the said first effective area (7) in the same direction as the restoring spring (5);

(d) a second effective area (8) on the main control-piston (3) in a second control-chamber (9), which counteracts the

said first effective area (8), is of the same size, and is subjected permanently to the pressure of the hydraulic system (A);

(e) a first pilot-valve (12) which, when the pressure falls short of the lower switching pressure, opens a connection between the hydraulic system (A) and the first control-chamber (6);

(f) a second pilot-valve (13) which, when the upper switching pressure is exceeded, opens a connection between the first control-chamber (6) and the outlet (T), characterized in that

(g) the first pilot-valve (12) is a seat-valve loaded by a control-spring (55), said first pilot-valve (12) being held open by said control-spring (55) when pressure is below the lower switching pressure and whose seat-surface (29) is exposed permanently to the pressure of the hydraulic system (A) and which, when the lower switching pressure is exceeded, causes the said seat-valve to close tightly;

(h) a second flow-path (21) exists between the hydraulic system (A) and the first control-chamber (6), said second flow path (21) being opened by the main control piston (3) in its first switching position and being closed thereby in the second switching position thereof, said second (21) flow-path also passing through the second pilot-valve (13) and being closed thereby when the upper switching pressure is reached;

(j) the pressure in the second flow-path (21) between the main control-piston (3) and the second pilot-valve (13) serves as the control-pressure for the second pilot-valve (13).

4,603,709

DEVICE IN A VACUUM TRANSPORTATION SYSTEM FOR LIQUIDS, PREFERABLY A VACUUM SEWAGE SYSTEM

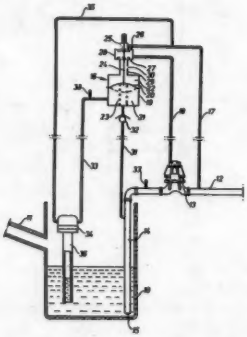
Camiel Huisma, Airdrie, Canada, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Feb. 6, 1985, Ser. No. 698,689

Claims priority, application Sweden, Feb. 10, 1984, 8400707

Int. Cl.[4] F16K *31/12, 31/128*

U.S. Cl. 137—205 **7 Claims**



1. A vacuum transportation system for liquids comprising a liquid collecting container, a transportation conduit adapted to be maintained under vacuum, a suction pipe having an entrance opening in said container and connecting said container to said transportation conduit, a normally closed pressure/-vacuum valve between said suction pipe and said transportation conduit, said valve having a pressure/vacuum operated control means, a pressure regulating unit capable of providing the control means for said pressure/vacuum valve and for, respectively, opening and closing said valve, a fluid pressure operated actuator responsive to the liquid level in said container, and pressure regulating valve means responsive to a certain pressure drop in said suction pipe occurring due to air entering said suction pipe when the liquid level in said container sinks below the level of the entrance opening of said suction pipe, said regulating means being arranged and connected via a pipe means connected at a point between the entrance opening of said suction pipe and said pressure/-vacuum valve to permit the air entering the entrance opening to act upon said pressure regulating unit for closing said pressure/vacuum valve.

4,603,710

NON-RETURN VALVE

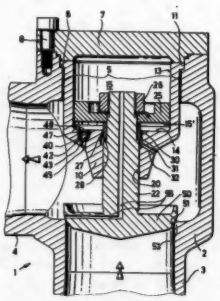
Edelbert Tiefenthaler, Elgg, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 26, 1982, Ser. No. 371,804

Claims priority, application Switzerland, May 25, 1981, 3404/81

Int. Cl.[4] F16K *21/10*

U.S. Cl. 137—514.7 **11 Claims**



1. A non-return valve comprising

a housing defining a chamber and including an inlet connection to said chamber, an installation opening opposite said inlet connection and an outlet connection from said housing chamber;

an insert fixedly mounted within said installation opening to define a second chamber coaxial to said inlet connection;

a movable valve body means including a displaceable piston dividing said second chamber into two coaxial cylinder chambers, a valve spindle secured to said piston and passing through a bore of said insert and a valve disc secured to said spindle for selectively sealing said inlet connection in response to movement of said means from a valve-open position to a valve-closed position;

a first connecting duct communicating said cylinder chamber between said piston and said installation opening with said housing chamber;

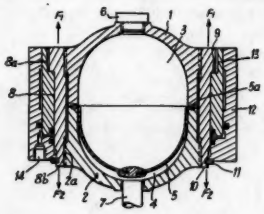
a second connecting duct communicating said cylinder chamber between said piston and said inlet connection with said housing chamber; and

a damping member secured to said movable valve body means for penetrating into said second duct to throttle flow therethrough upon movement of said means into said valve-closed position.

4,603,711
PRESTRESSED HYDRAULIC ACCUMULATOR

Louis C. Porel, Rambervillers Jeanmenil, France, assignor to Hydro Rene Leduc, France

Continuation-in-part of Ser. No. 236,195, Feb. 20, 1981, Pat. No. 4,492,013. This application Oct. 18, 1984, Ser. No. 661,663
Claims priority, application France, Feb. 27, 1980, 80 04313; Apr. 30, 1980, 80 09781
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 14 Claims



1. An oleopneumatic accumlator comprising:

a first shell having an open end forming a first chamber adapted to receive pressurized gas, and a second shell having an open end forming a second chamber adapted to receive a pressurized hydraulic fluid, a flexible membrane disposed at the open ends of said first and second chamber and forming fluid tight seals therewith;

an elastic metal annular clamping band which is pretensioned along a longitudinal axis prependicular to a diameter of the band by a predetermined amount corresponding to a hydraulic pressure applied to said second chamber at which said first and second shells separate, said band being stretchable primarily in the direction of the pretensioning along said longitudinal axis, said band diameter being oriented parrallel to said open ends;

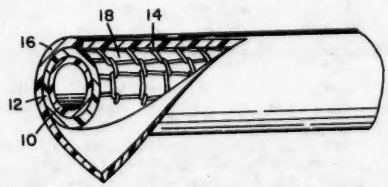
means for affixing said clamping band to said first and second shells to overlie the edges of said open ends thereof while still retaining at least a portion of said pretension to clamp the shells together; and

whereby said shells separate when hydraulic fluid pressure in excess of said predetermined amount of tension is applied to said second chamber.

4,603,712
COMPOUNDED POLYCHLOROPRENE FORMULATION USED AS AN ADHESIVE LAYER IN THE MANUFACTURE OF ELASTOMERIC ARTICLES

Keith M. Krause, Westminster, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Mar. 29, 1985, Ser. No. 717,622
Int. Cl.[4] F16L *9/14*
U.S. Cl. 138—137 26 Claims



1. A unitary reinforced vulcanized elastomeric hose article for conveying fluids including an inner tube and outer cover, which are composed of dissimilar polymers not readily bondable to one another comprising:

an inner tube made of a material selected from the group consisting of fluoroelastomers, fluoroplastics, polypropylene, polyvinylchloride, polyethylene, chlorinated polyethylene, and acrylonitrile polymers;

an outer heat setting cover made of a material selected from the group consisting of fluoroelastomers, fluoroplastics, polypropylene, polyvinylchloride, polyethylene, chlorinated polyethylene, and acrylonitrile polymers but dissimilar from the material selected for said tube;

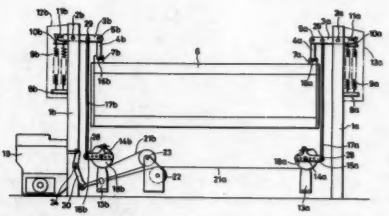
an elastomeric tie gum layer of compounded polychloroprene formulation incorporating a multifunctional amine accelerator and a multifunctional carboxylic acid retarder bonded through vulcanization to said inner tube and cover; and

a reinforcement layer embedded in the hose.

4,603,713
LIFTING DEVICE FOR A HEDDLE FRAME

Hiroshi Takada, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Feb. 24, 1984, Ser. No. 583,128
Claims priority, application Japan, Feb. 28, 1983, 58-33479
Int. Cl.[4] D03C *13/00*
U.S. Cl. 139—82 6 Claims



1. A lifting device for a heddle frame characterized in that in a motion transmission route between a shedding motion and a heddle frame there are provided a first motion transmission member for increasing an amount of displacement of an operating member moved by the shedding motion and a second motion transmission member for further increasing the amount of displacement of said first motion transmission member, and further characterized in that said motion transmission members are connected to each other by a connection member and the heddle frame is mounted on the second motion transmission member;

a. wherein the first motion transmission member comprises a pivotal lever which is pivoted about a first fixed pivot and a guide plate having a curved peripheral surface mounted on the pivotal lever, and wherein the operating member comprises a cable which is wound on and secured to the peripheral surface of the guide plate;

b. wherein the second motion transmission member comprises a carrier lever pivotably supported on a fixed frame through a second fixed pivot and having first and second ends on opposite sides of the fixed frame, wherein the heddle frame is hung on the first end of the carrier lever through a connector means and, wherein a spring is stretched between the second end of the carrier lever and the fixed frame; and

c. wherein the connection member for connecting the first and second motion transmission members comprises a connection rod, wherein the pivotal lever of the first motion transmission member is positioned below the carrier lever of the second transmission member, wherein the connection portion of the connecting rod to the pivotal lever is positioned away from the first fixed pivot of the pivotal lever from an acting point of the cable on the

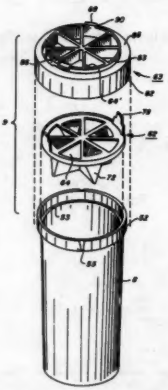
pivotal lever, and wherein the connection portion between the connecting rod and the carrier lever is positioned between the second pivot of the carrier lever and the connection portion between the connector means and the carrier lever.

4,603,714

TONER BOTTLE FOR COPIER/PRINTING MACHINES

Joseph J. Marotta, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1985, Ser. No. 712,931
Int. Cl.[4] B65B *1/06*
U.S. Cl. 141—383 7 Claims



1. A toner bottle of the type which fits over the toner inlet in the developer housing of a copier/printing machine to add toner to said machine without spilling or loss, comprising, in combination:

(a) a container for said toner, said container having a toner discharge opening at one end; and

(b) a cover for said container one end, said cover including

(1) a first iris member having at least one aperture therethrough for assembly with said container so as to close said container toner discharge opening except for said aperture,

said first iris member having at least one control tab projecting outwardly therefrom; and

(2) a second iris member having an aperture therethrough corresponding to each aperture in said first iris member, said first and second iris members cooperating with one another to form an iris adapted on predetermined relative rotation between said first and second iris members to align the aperture in said first iris member with the corresponding aperture in said second iris member to enable toner to discharge through said apertures from said container, said apertures when not aligned closing said container toner discharge opening;

said second iris member being sized to fit over said container one end to trap said first iris member therebetween and form said cover with said iris;

said second iris member having a slot for each of said first iris member control tabs, said slot having a predetermined length whereby to limit relative movement between said first and second iris members and establish open and closed positions of said iris;

said second iris member having at least one outwardly projecting locking tab;

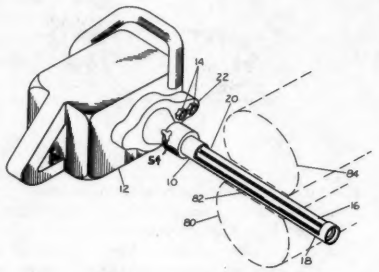
whereby on assembly of said bottle with said housing and rotation of said bottle, said second iris member locking tab is moved into locking engagement with said developer housing to attach said bottle to said developer housing while said first iris member control tab is locked against movement to establish relative movement between said first and second iris members through a distance established by the predetermined length of said slot to bring the apertures in said first and second iris members into alignment with one another and discharge toner from said container into said developer housing.

4,603,715

ATTACHMENT FOR POWER TOOL

Bruce Muehlhauser, Rte. 1, Sandstone, Minn. 55072

Filed Nov. 19, 1984, Ser. No. 672,662
Int. Cl.[4] B27C *9/02*
U.S. Cl. 144—1 E 2 Claims



1. A method of cutting surface of a log into a mirror image of the pre-cut surface of another log comprising,

(a) supporting said log with the pre-cut surface in a horizontal position with the pre-cut surface facing upward,

(b) placing the log to be cut in a position spaced a small distance above and parallel to said pre-cut log,

(c) providing a power driven rotating cutting element including an elongated rotatable cutting element comprising a plurality of elongated cutting elements spaced around the circumference thereof, said cutting element being provided with a coupling device adapted to engage a rotatable power drive means, shield means encircling the circumference of said cutting element, an opening being provided along one side of said shield means to expose one side of said cutting element, said shield means being attached to the stationary body of said drive means and thereby rendered non-rotatable, and having a smooth outer working surface adapted to slide along said pre-cut log, and

(d) sliding the shield along said pre-cut surface from one end to the other, thus causing said rotating cutting element to cut the lower surface of said upper log into a mirror image of said pre-cut log.

4,603,716

MACHINE FOR CONTOURING A WORKPIECE

William J. Rhodes, 3347 Campground Rd., Louisville, Ky. 40211

Filed Oct. 21, 1985, Ser. No. 789,337
Int. Cl.[4] B27C *5/00*
U.S. Cl. 144—134 A 15 Claims

1. A machine for contouring a workpiece comprising:

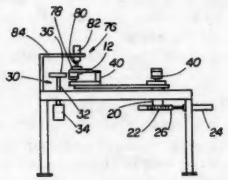
a framework;

a horizontal table mounted to the framework for oscillating movement in a horizontal plane between two predetermined points;

means for stopping movement of the table at two predetermined opposed points on its oscillating movement;

means for reversibly driving the oscillating table operatively connected to the stopping means for reversing the direction of movement of the table when the stopping means stops movement of the table;

workpiece fixture means for holding workpieces to be contoured at two different locations on the table spaced from each other by a distance corresponding to the distance through which the table oscillates; and,



workpiece cutter means mounted to the framework next to the table for contouring the periphery of each workpiece in the fixture means as the table means moves a fixture means into a position at the workpiece cutter means.

4,603,717

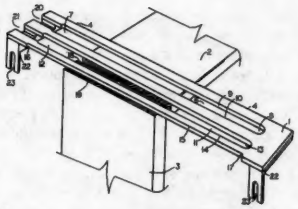
SLIDING DOVETAIL TEMPLATE

Donald E. Thomas, Rte. 2, Box 227, Mebane, N.C. 27302

Filed May 16, 1985, Ser. No. 735,828

Int. Cl.[4] B27C *5/10*

U.S. Cl. 144—144.5 GT **5 Claims**



5. A template for making tapered sliding dovetails in combination with a work positioning structure, comprising:

a plate constructed of a material sufficiently rigid to support a hand-held router, having:

an end;

a first longitudinally extending guide slot such that the opposite edges of said slot are straight and tapered toward each other, and such that said slot is capable of receiving a dovetail cutter;

a second longitudinally extending guide slot having a straight first guide edge, such that said slot is capable of receiving a dovetail cutter; and, a straight second guide edge on said plate;

such that said first and second guide edges are tapered toward each other;

and such that the tapering of the opposite edges of said first longitudinally extending guide slot, of said first guide edge of said second longitudinally extending guide slot and of said second guide edge are all toward the same end of said plate;

and such that the centerline between the opposite edges of first guide slot and the centerline between the first and second guide edges are parallel;

and further comprising a first gap in said plate disposed between said first longitudinally extending guide slot and an edge of said plate, sufficient in size to allow a dovetail cutter to be inserted into said first longitudinally extending guide slot through said first gap;

means on said template for securing said template to a work positioning structure;

a work positioning structure having:

a frame having a horizontal work receiving surface and a vertical work receiving surface;

means on said frame for securing said template to said work positioning structure;

means on said frame for securing a first workpiece to said work positioning structure such that said first workpiece is positioned between said plate and said horizontal work receiving surface; and

means on said frame for securing a second workpiece to said work positioning structure such that said second workpiece is positioned between said plate and said vertical work receiving surface.

4,603,718

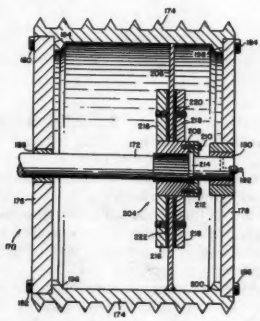
FEED ROLL CONSTRUCTION FOR LOG DEBARKERS

James H. Hutson, Rte. 4, P.O. Box 925, Pell City, Ala. 35125

Continuation of Ser. No. 696,528, Jan. 30, 1985, abandoned, which is a division of Ser. No. 527,814, Aug. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 430,794, Sep. 30, 1982, abandoned. This application Oct. 29, 1985, Ser. No. 792,243

Int. Cl.[4] B27L *1/00*; B27B *31/00*

U.S. Cl. 144—208 E **20 Claims**



1. For a log debarker having a rotating debarking mechanism and a first log feed roll positioned on one side of the rotating debarking mechanism and driven by a first drive shaft for feeding logs into the rotating debarking mechanism, a log debarker feed roll assembly comprising:

a second drive shaft,

a pair of spaced members at least one of which is disposed about said second drive shaft,

a second log feed roll connected to said spaced members and disposed at least partially about said second drive shaft,

said second log feed roll including a log engaging surface,

a connecting means positioned between said spaced members for connecting said log feed roll to said second drive shaft for transmitting at least part of the rotation from said second drive shaft to said second log feed roll and permitting slippage therebetween when said log engaging surface encounters excessive resistance to rotation, and

said spaced members at least in part keeping contaminants out of said connecting means.

4,603,719

DRILLING AND COUNTERBORING APPARATUS AND METHOD FOR TOE FASTENING

Max W. Durney, 417 E. D St., Petaluma, Calif. 94952

Filed Oct. 4, 1985, Ser. No. 784,152

Int. Cl.[4] B27M *1/08*; B27C *1/00*

U.S. Cl. 144—365 **14 Claims**

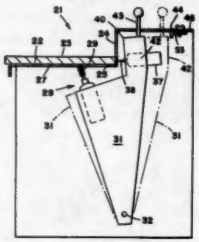
1. Apparatus for forming an obliquely oriented counterbore

in a surface of a workpiece and a fastener receiving bore proximate an edge of said workpiece comprising:

(a) means associated with said apparatus for supporting said workpiece in a position for formation of said counterbore and said bore;

(b) router means movably mounted to said apparatus and oriented with the axis of rotation of the cutting bit of said router means generally perpendicular to the direction of motion of said router means, said router means being mounted for movement progressively inwardly to cut a tapering recess in said surface terminating in a shoulder transverse to said surface proximate and in spaced relation to said edge to form said obliquely oriented counterbore; and

(c) drill means movably mounted to said apparatus and oriented with the axis of rotation generally parallel to the direction of motion of said drill means and generally perpendicular to said axis of rotation of said router means, said drill means being mounted for movement in a direction to drill said bore from said edge into said workpiece a distance and direction causing said bore to communicate with said counterbore.



9. A method of forming an obliquely oriented counterbore in a surface proximate an edge of a workpiece and a connecting fastener receiving bore between said counterbore and said edge comprising the steps of:

advancing router means oriented with the axis of rotation of the cutting bit of said router transverse to said surface in which said counterbore is to be formed and along a path to progressively cut an inwardly tapering counterbore in said surface terminating in a transverse shoulder, and

advancing drill means from said edge inwardly in said workpiece until said bore extends to a position which will communicate with said counterbore.

4,603,720

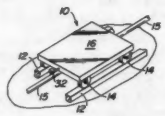
DRIVE WHEEL FOR DRIVERLESS VEHICLE

Charles E. Jacoby, Bethlehem, Pa., assignor to SI Handling Systems Inc., Easton, Pa.

Filed Jun. 29, 1981, Ser. No. 278,768

Int. Cl.[4] B60C *11/10*; B61B *13/12*

U.S. Cl. 152—209 R **5 Claims**



1. Apparatus comprising a drive wheel for a driverless vehicle, said drive wheel having a solid plastic tire portion, said tire portion having an outer peripheral surface adapted for frictional contact with a drive shaft, said tire portion having means for expelling liquid from the surface of a drive shaft, said means including rows of discrete recesses on the outer peripheral surface of said tire portion with each recess being completely surrounded by land area, the space between rows being at least as large as the transverse dimensions of the recesses at said outer peripheral surface of the tire portion.

4,603,721

BASE-CAP TIRE TREAD

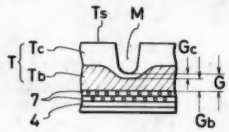
Tomohiko Kogure, Minami-ashigara; Ryoji Hanada, and Kazuyuki Kabe, both of Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,729

Claims priority, application Japan, May 31, 1984, 59-109627

Int. Cl.[4] B60C *11/00*

U.S. Cl. 152—209 R **2 Claims**



1. A pneumatic tire which has on its tread surface a tread pattern formed by grooves and has a tread rubber of a two-layer structure comprising a cap rubber layer and a base rubber layer of which the latter comprises a rubber having a lower heat generating characteristic in comparison to a rubber forming the former, the tire having a value of $(Gc/G)\times(Eb/Ec)$ within the range of from 0.15 to 0.35 when the total thickness of said tread rubber at bottoms of said grooves in the tread pattern is G, the thickness of said cap rubber layer at the same bottoms of the tread pattern grooves as above being Gc, the modulus at 25% elongation of the rubber of said base rubber layer being Ec and that of the rubber of said cap rubber layer being Ec.

4,603,722

TIRE TREAD COMPRISED OF BRANCHED STYRENE-BUTADIENE COPOLYMERS

Noboru Oshima, Suzuka; Isamu Shimizu, Kameyama; Yoshito Yoshimura, Yokkaichi; Tatsuo Fujimaki, Higashimurayama, and Seisuke Tomita, Tokorozawa, all of Japan, assignors to Bridgestone Tire Company and Japan Synthetic Rubber Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 473,394, Mar. 8, 1983, Pat. No. 4,526,934. This application Sep. 28, 1984, Ser. No. 655,288

Claims priority, application Japan, Mar. 19, 1982, 57-42955; Mar. 25, 1982, 57-47946

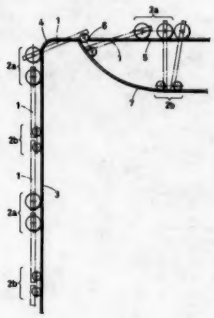
Int. Cl.[4] C08F *8/18*

U.S. Cl. 152—209 R **1 Claim**

1. A pneumatic tire comprising a toroidal carcass reinforcement, and a tread portion superimposed about a crown region of said carcass and having a cap/base structure of tread base rubber and tread cap rubber, the improvement wherein said tread base rubber is a rubber composition containing (1) at least 20 parts by weight of branched styrene-butadiene copolymer rubber based on 100 parts by weight of the total rubber content, wherein said branched styrene-butadiene copolymer rubber has a bound styrene content of 3–15% by weight and a vinyl bond content in the butadiene portion of not less than 30% but less than 50%, and is produced by coupling a styrene-butadiene copolymer anion with a tin halide compound and (2) not less than 30 parts by weight of at least one of natural rubber

and polyisopropene rubber based on 100 parts by weight of the total rubber content.

4,603,723
SHUTTER
Toshihiko Sugihara, Mihara, Japan, assignor to Kyoritsu Kikai Co., Ltd., Hiroshima, Japan
Filed Sep. 26, 1984, Ser. No. 654,784
Claims priority, application Japan, Oct. 18, 1983, 58-194976
Int. Cl.[4] E06B 9/32
U.S. Cl. 160—35 15 Claims



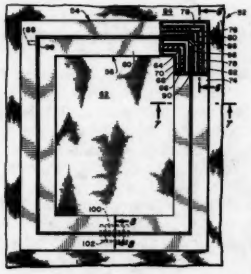
4. A shutter capable of repeatedly sliding on guide posts from a closed position to an open position such that said shutter includes a multiplicity of rollers some of which are larger than others, said shutter being stored on support means when in the open position, said shutter comprising:

a plurality of slats having ends and longitudinal edges;

a plurality of roller hinge mechanisms arranged for rolling on said guide posts and said support means; said hinge mechanism comprising

connecting means which includes pairs of larger rollers and pairs of smaller rollers arranged alternately to connect said slats to one another such that said longitudinal edges of said slats are adjacent when said shutter is in the closed position and are separable yet connected when in open positions.

4,603,724
PET DOOR FOR A SCREEN
Michael J. Borwick, Santa Barbara, Calif., assignor to Borwick Innovations, Inc., Goleta, Calif.
Filed Dec. 29, 1980, Ser. No. 221,347
Int. Cl.[4] E06B 7/28
U.S. Cl. 160—180 4 Claims

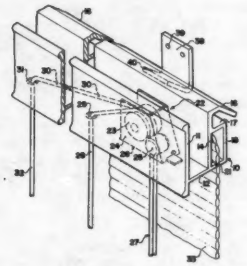


1. In combination with a door screen located in a given plane, said door screen having an access opening, a pet door comprising:

a fixed frame forming an enclosed area, said fixed frame being attached only to said screen, said fixed frame comprising a first member and a second member which interfit together securely binding said screen therebetween, said fixed frame being located directly adjacent said access opening with said enclosed area being within said access opening, said first member including an elongated groove formed by a pair of elongated upstanding side wall members, said second member including an elongated protuberance, said elongated protuberance to be located within said elongated groove in a mating male and female arrangement with said upstanding side wall members exerting a continuous bias toward said elongated protuberance and said screen to be located between said side wall members and said elongated protuberance; and

a door mounted on said fixed frame and located within said enclosed area, said door being pivotable on said fixed frame on a pivot axis, said pivot axis being located substantially within said given plane, said door to be movable from a closed position located within said given plane to an open position permitting movement of a domesticated animal through said access opening.

4,603,725
HEADRAIL FOR A WINDOW BLIND
Douglas W. Knight, 1376 Liberty St., Winnipeg, Manitoba, Canada R3S 1A6
Filed Aug. 24, 1984, Ser. No. 643,954
Int. Cl.[4] A47G 5/02
U.S. Cl. 160—243 4 Claims



1. A headrail for a window bind comprising an integral extruded section defining a first upright wall providing a front valance, a second horizontal wall connected to said first wall adjacent a lower edge thereof, a third upright wall parallel to the first wall and connected to said second wall at an edge thereof so as to define a pulley channel rearwardly of the valance for receiving a cord pulley device for raising and lowering the blind, said third wall extending to a position substantially the same height as an upper edge of the valance, a fourth horizontal wall interconnected with said third wall at an intermediate height thereof, a fifth wall extending downwardly from said fourth wall to a position of the same height as the bottom of the third wall, a pair of flanges extended inwardly toward one another from the bottom edge of the fifth wall and the bottom edge of the third wall so as to define therebetween a slot of reduced dimension relative to the spacing between the third and fifth walls for receiving and clamping the edge of the blind and a sixth wall connected to the top edge of the third wall and extending generally in a direction away from the valance and downwardly for cooperation with an upwardly and forwardly directed hook member whereby the headrail can be attached to a suitable surface for supporting

the blind depending downwardly therefrom rearwardly of the valance and the pulley channel.

4,603,726

METHOD OF MAKING INDIVIDUAL CASTINGS

Hubert Pfannenstiel, Lenggries, and Heinz-Joachim Hübner, Wörthsee, both of Fed. Rep. of Germany, assignors to ESPE Fabrik pharmazeutischer Präparate GmbH, Seefeld, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,190

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240907

Int. Cl.[4] B22C *9/02*

U.S. Cl. 164—35 **1 Claim**

1. In a method of making relatively small individual independent metal dental castings that are three-dimensional in configuration by building up, in the field of dental engineering, including a positive model of a crown, an inlay, a bridge, the secondary part of a conical crown, telescopic crown, double crown, or a male part for individual attachments, as well as a telescoping anchor, bar attachment, or soldering connection, said method having the improvement therewith comprising steps of:

building up a dental casting model at least partially by photopolymerizing a photopolymerizable compound for hardening in combination therewith;

applying said photopolymerizable compound in a plurality of layers, and individually subjecting each layer to photocuring using visable light in the wave length range of 400–500 nm;

thereafter securing at least one sprue to said casting model;

embedding said dental casting model in a refractory molding compound;

heating said refractory molding compound and said embedded dental casting model to a temperature of 500°–700° C. to melt and/or burn out said dental casting model, free of residue, from said molding compound and to form a mold therein;

introducing molten metal into said mold to form a specific dental casting;

cooling said mold and casting; and

finally removing said dental casting from said mold;

said photopolymerizable compound contains one of the compounds selected from the group consisting of acrylic acid ester and methacrylic acid ester.

4,603,727

FLEXIBLE PERMEABLE VALVE FOR MELT SPINNING PROCESS

Shih C. Hsu, Wellesley, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 22, 1984, Ser. No. 623,661

Int. Cl.[4] B22D *39/00, 41/10*

U.S. Cl. 164—133 **6 Claims**

1. Apparatus for producing chill-cast metal foil comprising

a chill wheel having a chill surface;

a reservoir for holding molten metal, said reservoir having an inside surface and having an orifice for directing the molten metal upon said chill surface;

heating means for maintaining the molten metal above its melting point in said reservoir;

gas permeable molten metal retaining means for retaining the molten metal in said reservoir and for effecting a purging of said orifice with a non-oxidizing purging gas, said gas permeable molten metal retaining means being flexible and conforming to said inside surface of said reservoir, said gas permeable molten metal retaining means being adapted to move to a position covering said orifice or to a position uncovering said orifice; and

means for effecting expulsion of the molten metal contained in said reservoir through said orifice onto said chill surface of said chill wheel to form a chill-cast metal foil.

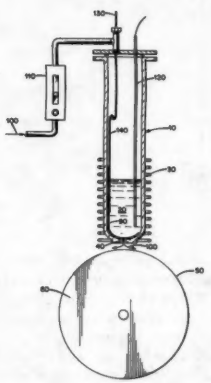
6. A method for producing a chill-cast metal foil comprising adding a charge of metal into an apparatus for producting chill-cast metal foil; said apparatus comprising

a chill wheel having a chill surface;

a reservoir for holding molten metal, said reservoir having an inside surface and having an orifice for directing the molten metal upon said chill surface;

heating means for maintaining the molten metal above its melting point in said reservoir;

gas permeable molten metal retaining means for retaining the molten metal in said reservoir and for effecting a purging of said orifice with a non-oxidizing purging gas, said gas permeable molten metal retaining means being flexible and conforming to said inside surface of said reservoir, said gas permeable molten metal retaining means being adapted to move to a position covering said orifice or to a position uncovering said orifice; and



means for effecting expulsion of the molten metal contained in said reservoir through said orifice onto said chill surface of said chill body;

purging said reservoir, said metal, and said orifice with a non-oxidizing purging gas;

heating said metal in said reservoir to form a molten metal;

purging of said reservoir and said orifice with said non-oxidizing purging gas, the purging of said orifice occurring by passage of purging gas from the resevoir to the orifice through the gas permeable retaining means; and

removing said gas permeable molten metal retaining means from said orifice effecting a flow of the molten metal through said orifice and impinging of the molten metal on said chill surface of said chill wheel forming a chill-cast metal foil.

4,603,728

APPARATUS FOR OBTAINING IMPROVED DENTAL CASTINGS

Carl H. Rousseau, 1510 Barry St., Clearwater, Fla. 33516

Continuation-in-part of Ser. No. 385,025, Jun. 4, 1982, Pat. No. 4,508,155. This application Apr. 1, 1985, Ser. No. 718,178

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] B22C *7/02, 9/04, 21/00*

U.S. Cl. 164—237 **17 Claims**

1. An apparatus for the preparation of a full arch dental casting for a patient from a full arch wax dental pattern using an exothermic investment material which expands upon curing comprising:

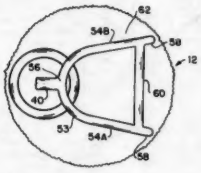
an expandable investment container means having a base means;

said base means defined by a plate having a top and a bottom

surface with a substantially circular lip extending from said top surface;

a sprue former operatively disposed on said base means;

a runner bar means operatively disposed on said sprue former comprising a proximal end portion means and a distal end portion means;



said distal end portion means for receiving the full arch dental pattern and forming a first and second curved configuration portion which together approximate the curved configuration of the jawbone of the patient; and

means for interconnecting said first and second curved configuration portion of minimizing the distortion of the distance between the distal ends of said runner bar means during curing of the exothermic material.

4,603,729

PIPING ASSEMBLY FOR USE IN ROLL SECTION OF CONTINUOUS CASTING LINE

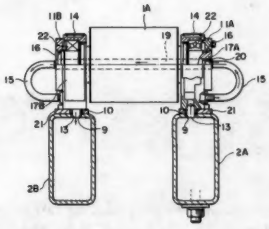
Hiroshi Kawaguchi; Hirofumi Sasaki; Mamoru Nishida, and Shinichi Harada, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 25, 1984, Ser. No. 603,898

Claims priority, application Japan, Jun. 17, 1983, 58-93443[U]; Jun. 17, 1983, 58-93444[U]

Int. Cl.⁴ B22D *11/12*

U.S. Cl. 164—442 **8 Claims**



1. A piping assembly for cooling a roller section in a secondary cooling zone of a continuous casting line, comprising:

a support frame having a plurality of pairs of partition walls formed therein, a cooling inlet and outlet, and a cooling fluid passageway;

a plurality of pairs of bearing boxes mounted on said frame, wherein each of said bearing boxes includes a base portion having a fluid passage in direct communication with said cooling fluid passageway of said frame and wherein each of said bearing boxes includes a shaft hole;

a roller mounted on each of said pairs of bearing boxes and having an axial passageway formed therein for communicating with said fluid passages of said pairs of bearing boxes; and

first and second circulating pipes located on opposite ends of said roller and each having one end secured to an outer wall of said bearing boxes and in communication with said fluid passage and a second end centrally positioned in said shaft hole of said bearing boxes for communicating with the axial passageway of said roller.

4,603,730

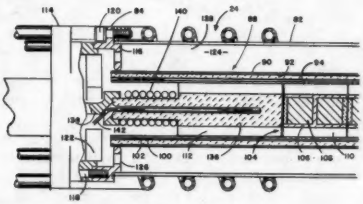
MULTIPLE MODULE FURNACE SYSTEM

Esker K. Davis, La Canada, and William F. Chew, Playa Del Rey, both of Calif., assignors to GTI Corporation, San Diego, Calif.

Filed Jun. 30, 1982, Ser. No. 393,748

Int. Cl.⁴ F27D *9/00*

U.S. Cl. 165—30 **10 Claims**



1. A self-contained furnace module for heating a sample in outer space and a control system therefor, said furnace module and control system being secured to a furnace frame within a space flight vehicle and comprising:

furnace means for heating the sample,

said furnace means having an outer protective tube and an inner heater carrying tube, each of said inner and outer tubes having a cylindrical configuration and being coaxially spaced relative to one another,

thermal insulation disposed between said outer protective and inner heater carrying tubes,

at least one crucible located within and spaced from said inner heater carrying tube of said furnace means for receiving therewithin the sample to be heated,

a plurality of spacer means extending radially from said at least one crucible to said inner heater carrying tube so as to form fluid channels therebetween and provide heat exchange surfaces to dissipate heat developed at said crucible,

means for supplying a cooling fluid surrounding the outer protective tube of said furnace module for providing thermal isolation of said module from the surrounding environment,

means for supplying a heat exchange fluid to the fluid channels formed between said spacer means,

heater means interfaced with said inner heater carrying tube for supplying heat to said crucible,

power supply means for activating said heater means,

sensing means interfaced with said heater means for supplying a signal that is indicative of the temperature developed by said heater means,

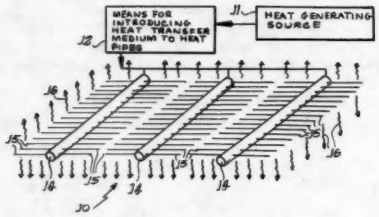
signal processing means to receive the temperature indicating signal from said sensing means and control the respective operations of said cooling fluid supply means and said heat exchange fluid supply means, and

feedback temperature control means interconnected between said signal processing means and said heater means for controlling the operation of said heater means and causing the heating of said furnace means to a particular predetermined temperature for a particular predetermined time.

4,603,731
GRAPHITE FIBER THERMAL RADIATOR

Randall B. Olsen, Olivenhain, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Nov. 21, 1984, Ser. No. 674,052
Int. Cl.[4] F28F *1/30*
U.S. Cl. 165—41 **5 Claims**



1. A thermal radiating system for use in conjunction with a heat source to dissipate the heat created thereby comprising, in combination:

a heat transfer fluid in thermal contact with the heat source;

at least one heat pipe through which the heat transfer fluid is circulated;

means for circulating the heat transfer fluid through heat pipes; and

a plurality of graphite fibers associated with each heat pipe, the graphite fibers being disposed in substantially parallel co-planar relation to each other, spaced from one another and extending substantially perpendicular to their associated heat pipe, the adjacent fibers being spaced a sufficient distance from each other so that the heat radiated from the fibers substantially radiates into free space.

4. In a thermal radiator for use in outer space to dissipate heat by radiation only, the combination comprising:

an array of at least two heat-conducting conduits disposed in substantially parallel, co-planar relation and each carrying a heat transfer fluid therein;

means including a plurality of elongated graphite fibers associated with each heat-conducting conduit, each fiber associated with each heat-conducting conduit being disposed in substantially perpendicular relation to the conduit and extending in substantially parallel, co-planar relation to every other fiber, the graphite fibers associated with each heat conducting conduit being co-planar with the graphite fibers associated with every other heat conducting conduit in the array and having a small mass per unit area, a high ratio of heat transfer by radiation to the mass thereof, and superior ionizing radiation resistance characteristics.

4,603,732
HEAT MANAGEMENT SYSTEM FOR SPACECRAFT

Richard E. Niggemann, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 9, 1984, Ser. No. 578,475
Int. Cl.[4] F28D *15/00*; B64G *1/50*
U.S. Cl. 165—41 **16 Claims**

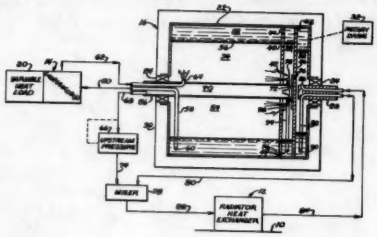
13. A heat management system for use in spacecraft or the like comprising a first heat exchanger of the radiator type for radiating heat into space;

a second heat exchanger for transferring heat from a variable heat load on a spacecraft;

means for establishing a heat exchange fluid flow path between said heat exchangers;

means for regulating fluid flow in said flow path; and

a pump forming part of said flow path comprising a rotary drum driven about an axis at sufficient speed to cause fluid therein in the liquid phase to move radially outwardly and form an annular body of liquid fluid surrounding a body of gaseous fluid with said drum, and a liquid pickup having

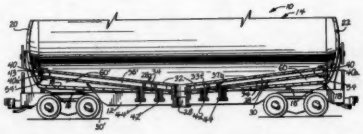


an inlet in said body of liquid fluid and relatively movable relative thereto.

4,603,733
HEATED RAILROAD TANK CAR

Richard Loevinger, P.O. Box 68, Brandon, S. Dak. 57005

Continuation of Ser. No. 454,537, Dec. 30, 1982, Pat. No. 4,476,788, which is a continuation-in-part of Ser. No. 385,869, Jun. 7, 1982, Pat. No. 4,480,370. This application Aug. 24, 1984, Ser. No. 643,867
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[4] F28F *9/22*
U.S. Cl. 165—41 **3 Claims**



1. For use in a combination of a lading carrying tank having a discharge duct and a heat exchanger for heating a congealable lading in said tank, said heat exchanger being formed from two sections extending along a longitudinal axis of said tank and each section including first and second portions, said first portion extending substantially across the lower portion of said tank and sloping downwardly a substantial extent between an end of the tank and the discharge duct, said first portion having a plurality of longitudinally extending flow passages adapted to receive and conduct a heated medium, said second portion being located in the tank in a lower area than said first portion and substantially encompassing in heat exchange relationship said second portion having inlet and outlet port means for the heated medium and forming an extension of said discharge duct, said discharge duct being in said lower area, whereby said heat exchanger through the flow of said heated medium in said plurality of longitudinally extending flow passages, provides sufficient heat to the lading in the lower area of the tank to develop a rolling flow of the lading, said second portion having one of the port means adjacent said discharge duct extension.

4,603,734

HEAT EXCHANGE ELEMENT OF THE AIR-TUBE TYPE

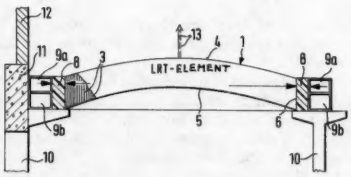
Hermann Heeren, and Wilhelm Wendel, both of Nuremberg, Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 698,933

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404376

Int. Cl.[4] F28F *9/00*

U.S. Cl. 165—67 2 Claims



1. A heat exchange element of the air-tube type for a heat exchanger unit; said heat exchange element being connected via flexible connecting lines with liquid supply and withdrawal channels having transition surfaces therebetween and which are otherwise separated from said element; together with said channels, said heat exchange element being supported on a support structure which has a relatively large open space between support members thereof; that dimension of said element measured in the longitudinal direction of said tubes thereof being relatively short; air flow occurring internally through said tubes, and liquid flow occurring externally around said tubes; said heat exchange element being disposed on said support members in such a way that it has a top side and a bottom side, upon one of which air impacts, and from the other of which air exits;

the improvement therewith which comprises: an arched dome on said top side and said bottom side of said heat exchange element being curved in a dish-shaped manner so that absorbing of thermal expansion of said heat exchange element occurs via deformation of said arched dome with which only compressive forces are generated at transition surfaces to liquid supply and withdrawal channels and said compressive forces can be readily absorbed without great difficulty, and said tubes of said heat exchange element being parallel so that when said heat exchange element is disposed on said support members, said tubes of said element extend substantially vertically, and substantially normal to said top side and said bottom side of said element due to elimination of any requirement for disposing said heat exchange element at an incline relative to horizontal relationship as is otherwise necessary for any parallelpipedal heat exchange element; said arched dome also increasing inherent rigidity of said heat exchange element therewith.

4,603,735

DOWN THE HOLE REVERSE UP FLOW JET PUMP

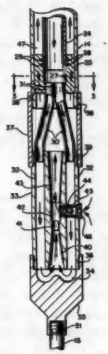
John B. Black, Longview, Tex., assignor to New Pro Technology, Inc., Fort Worth, Tex.

Filed Oct. 17, 1984, Ser. No. 661,937

Int. Cl.[4] E21B *43/00*

U.S. Cl. 166—68 30 Claims

1. A down the hole reverse up flow jet pump in a system operational with circulation fluids pumped from above the earth surface comprising: an in the well down the the hole up flow jet pump; down flow fluid passage means connected to said jet pump and extending up the hole to the well head at the surface; up flow fluid passage means connected to said jet pump and extending up the hole to the well head at the surface; a jet pump elongate body with down flow fluid passage means extended through said body from top to bottom thereof connected to and forming an extension of said down flow fluid passage means connected to said jet pump and extending up the hole to the well head at the surface; fluid flow reversing means mounted on the bottom of said jet pump elongate body; lowering opening means in said body extending from the bottom of said body to a venturi chamber in said body with said lower opening means narrowing from its bottom to its upper exit opening to said venturi chamber for accelerated fluid flow into and through said venturi chamber; said venturi chamber being of greater transverse cross-sectional area that the upper exit opening of said lower opening means; upper opening means in said body extending from said venturi chamber to the top of



said jet pump elongate body with said upper opening means connected to said up flow passage means; and with said jet pump elongate body including venturi transverse inlet side vent means extended from the exterior of said body to said venturi chamber for vacuum effect drawing of well fluids and/or gases from the well casing and a well production zone into the fluid flow stream for passage from the jet pump body to and up said flow fluid passage means to the well head and from the well; and wherein said jet pump elongate body is generally a cylindrical body; said lower opening means in said body is a center opening in the form of a truncated cone narrowing from its larger bottom to its smaller upper exit opening; and with said venturi chamber a centrally located cylindrical chamber.

4,603,736

METHOD OF PRODUCING SIDE-POCKET MANDRELS FREE OF WELDS

Norman Moore, 2 Lisnalinchy Road West, Ballyclare, County Antrim, Ireland

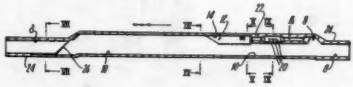
PCT No. PCT/GB83/00224, § 371 Date May 11, 1984, § 102(e) Date May 11, 1984, PCT Pub. No. WO84/01120, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 12, 1983, Ser. No. 611,002

Claims priority, application United Kingdom, Sep. 11, 1982, 8225962

Int. Cl.[4] E21B *7/00;* B21D *53/00*

U.S. Cl. 166—117.5 7 Claims



1. A method of producing a side-pocket mandrel comprising:

(A) axially boring a cylindrical metal bar of predetermined length and diameter from each of the two ends thereof to predetermined depths to leave a land between the blind bores;

(B) boring through said land from end to end thereof to provide a bore of smaller diameter than said blind bores and coaxial with or axially offset from but parallel to said blind bores;

(C) machining through said land at least one bore which is symmetrical about a diametrical plane of said smaller bore is of semicircular arch periphery from one end of said land with the plane and parallel flanks thereof penetrating said smaller bore and effectively forming a window of actuate segmental shape in the periphery of the latter, and continues into a full bore of predetermined peripheral shape forming a valve pocket separated from and axially parallel to said smaller bore and emerging from the other end of said land;

(D) forming holes through said bar in a chordal plane and intersecting said valve pocket;

(E) swaging both ends of the bar to provide end lengths of lesser external diameter and axially aligned with said smaller bore;

(F) trueing the bores in said end lengths to match said smaller bore; and

(G) machining an orienting sleeve in the mandrel near one end thereof.

5. A side pocket mandrel comprising:

an elongate block of material;

a swaged end on each end of said elongate block defining the exterior of the side pocket;

a through bore passing lengthwise through said block and being substantially concentric with said swaged ends;

a valve pocket in said side pocket in said elongate block parallel to and separated from said through bore; and

a discriminator on one end of said valve pocket that opens said valve pocket into said through bore,

thereby providing a weld-free mandrel having improved durability.

4,603,737

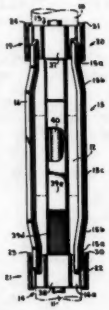
LINE PROTECTOR

Hugh D. Spikes, P.O. Drawer W, Weatherford, Tex. 76086

Filed Aug. 29, 1985, Ser. No. 770,434

Int. Cl.[4] E21B *17/10*

U.S. Cl. 166—241 **9 Claims**



1. A protector for down hole lines which are attached externally to well production tubing in a well bore, said tubing made up of lengths thereof connected together at intervals by coupling collars comprising, in combination:

(1) a first collar encircling a tubing length adjacent the lower end thereof above a coupling collar,

(2) a second collar encircling a second tubing length adjacent the upper end thereof below said coupling collar,

(3) limited opposed portions of said collars axially outwardly formed the entire length of the collar,

(4) an elongate channel for receiving a down hole line fixed at the upper and lower ends thereof to said collars in the outwardly formed portions thereof,

(5) said channel outwardly formed at each end thereof adjacent said collars whereby to provide an elongate central length thereof operative to overlie said coupling collar and

(6) a plurality of beam members connecting said collars together and spacing them apart positioned at intervals therearound,

(7) at least two of said beam members being rigid, positioned one on each side of said channel and outwardly formed at each end thereof adjacent said collars, whereby to provide outwardly spaced elongate central portions thereof operative to overlie said coupling collar,

(8) said rigid beam members operative to aid in protecting said channel on said tubing string in said well bore.

4,603,738

PROCESS AND MEANS FOR PREVENTING BLOCKAGES OF CRUDE OIL DEPOSITS BY THE FORMATION OF EMULSION DUE TO DEPOSITS OF ASPHALT

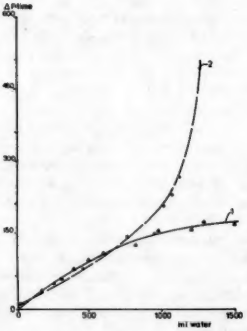
Wolfgang Oberkirch; Armand de Montigny, and Hansjürgen Botsch, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 9, 1985, Ser. No. 689,756

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401486

Int. Cl.[4] E21B *43/16*

U.S. Cl. 166—275 **5 Claims**



1. In the injection of flood water into crude oil deposits, the improvement which comprises including in the water a polyorganopolysiloxane-polyoxyalkylene block copolymer of the formula

$$[R^1Si(OSiR_2)_n]_mZ_{m-1}(OR^2)_{m+2}$$

in which

R represents an alkyl group having up to 4 carbon atoms,

R^1 represents the substituent R or a phenyl radical,

R^2 represents a group of the formula

$$R^3(OCH_2CH_2)_x(OCH_2-\underset{CH_3}{CH})_y-$$

Z represents —O— or

$$-O-\left[\begin{array}{c} R^3 \\ | \\ C \\ | \\ R^4 \end{array}\right]_p -O-,$$

R^3 represents a hydrocarbon radical having up to 4 carbon atoms,

R^4 represents hydrogen or a hydrocarbon radical having up to 4 carbon atoms,

n represents a number from 3 to 30,

m represents a number from 1 to 15,

x, y represent numbers which are selected in each case such that when m, n, and p are fixed, the compound is water-soluble, and $y \leqq 52$ and x and $x+y \leqq 68$,

$p \geqq 2$, but does not exceed the value which makes the compound water-insoluble when m, n, x and y are fixed,

whereby the injection pressure is reduced.

4,603,739

PROCESS FOR CLEANING AN OIL FIELD WELL BORE HOLE USING AN INTERNAL CASING WIPER

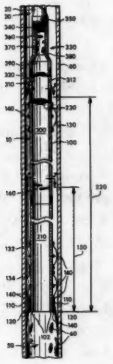
Michael E. Krugh, Lafayette, La., assignor to Marathon Oil Company, Findlay, Ohio

Continuation of Ser. No. 459,566, Jan. 20, 1983, Pat. No. 4,515,212. This application Jan. 22, 1985, Ser. No. 693,487

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.[4] E21B *31/08, 31/03, 37/00, 37/02*

U.S. Cl. 166—311 **4 Claims**



1. A process for removing debris from a cased well bore hole containing a fluid in a substantially static environment comprising the steps of:

continuously lowering a tubular tool into the well bore hole during a collection mode to create relative circulation of the fluid through the tubular tool while;

scraping the debris from the casing of the well bore hole into the fluid by a scraping means affixed to the lower end of the tubular tool;

feeding the debris-containing fluid to the interior of the tubular tool via an opening in the lower end of the tool;

filtering the debris-containing fluid upward across a first filtering means cross-sectionally positioned within the tubular tool;

collecting the debris filtered from the fluid in a collection means positioned below the first filtering means in the tubular tool;

opening a valve, which permits upward flow of filtered fluid through the valve but not reverse downward flow of fluid through the valve and which is positioned cross-sectionally in the tubular tool above the first filtering means and below a port in the upper end of the tool;

expelling the filtered fluid from the interior of the tubular tool via the port which provides fluid communication between the interior of the tool and the well bore hole; and thereafter

continuously raising the tubular tool in the wall bore hole during a retrieval mode while;

closing the valve to substantially prevent downward flow of fluid across the filtering means; and

removing the debris contained in the collection means of the tubular tool from the well bore hole.

4,603,740

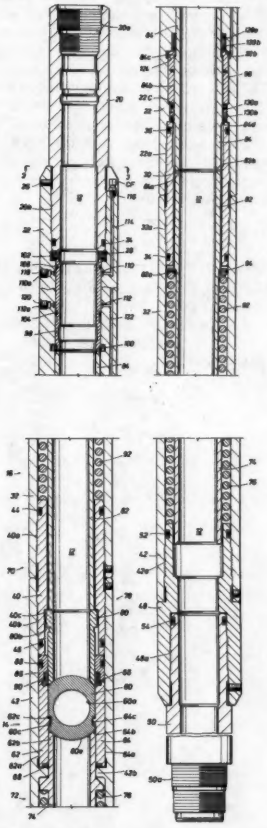
SUBSURFACE SAFETY VALVE

Jon L. Edwards, and Mark L. Carter, both of Houston, Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Aug. 29, 1984, Ser. No. 645,408

Int. Cl.[4] E21B *34/10*

U.S. Cl. 166—319 **6 Claims**



1. A subsurface safety valve apparatus for use in controlling flow in a well conduit providing a desired fluid flow path in the well for the production of well fluids, including:

a valve housing having means for connecting said valve housing in a well conduit providing the desired fluid flow

path, said valve housing having a flow passage formed therethrough which communicates with the well conduit when connected therewith to form a portion of the well conduit at a desired subsurface location in the well;

flow closure means disposed in said flow passage for movement to and from a closed position for blocking flow of fluid through said flow passage and an open position for enabling flow of fluid through said flow passage;

operator means mounted with said housing for moving said flow closure means longitudinally in said flow passage to and from the open and closed positions, said operator means having an operator sleeve assembly reciprocably disposed in said bore;

said operator means having means for urging said flow closure means to the closed position;

means for sealing said operator sleeve assembly with said housing to form an expansible chamber therebetween, said operator sleeve assembly having a pressure responsive surface exposed to the fluid pressure in said expansible chamber for moving said operator sleeve assembly for moving said flow closure means to the open position;

means for selectively communicating a control fluid pressure into said expansible chamber for moving said flow closure means to the open position when desired;

said means for sealing including a first pair of seals and a second pair of seals, each of said first pair of seals being pressure energized and facing in opposite directions to prevent leakage into or out of said expansible chamber, each of said second pair of seals being pressure energized and facing in opposite directions to prevent leakage into or out of said expansible chamber; and

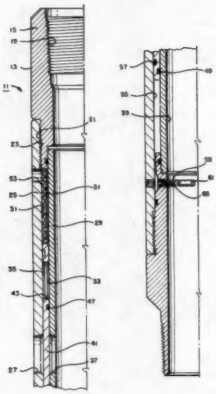
said housing having a longitudinally split guide ring disposed between said first pair of seals and said second pair of seals for preventing extrusion of said first and second pairs of seals by fluid pressure.

4,603,741

WEIGHT ACTUATED TUBING VALVE

John W. Edgmon, Conroe, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Feb. 19, 1985, Ser. No. 703,585
Int. Cl.[4] E21B *34/06*
U.S. Cl. 166—369 **2 Claims**



1. A method of producing well fluids from a well annulus through a tubing conveyed production valve, comprising the steps of:

connecting a tubing sub within a well tubing string, the tubing sub having an outer cylindrical sidewall with at least one opening therein, and having an inner mandrel spaced-apart from said outer cylindrical sidewall to thereby create an annular space between the exterior of said inner mandrel and the interior of said outer cylindrical sidewall, said inner mandrel having at least one opening therein which communicates the interior of said tubing string with said annular space;

positioning a sliding sleeve within said annular space in a first position which closes off said mandrel opening from said annular space;

supporting said sliding sleeve in said first position by filling said annular space below said sliding sleeve with a substantially incompressible fluid;

initially sealing said fluid within said annular space by means of a frangible member which seals off said annular space from said tubing sub interior, the frangible member being positioned to extend within said tubing sub interior in the path of an object dropped through said tubing string;

running the well tubing string containing the production valve into a desired well bore location with said production valve in said first, closed position;

dropping a weight from the well surface, down said tubing interior to sever said frangible member, thereby releasing said support fluid and opening said production valve; and

wherein said tubing string interior is unpressured at the time said valve is opened.

2. A weight actuated, tubing conveyed, production valve, comprising:

a tubing sub having upper and lower connecting ends for installation within a string of tubing extending from the surface within a well bore, said tubing sub having an outer cylindrical sidewall with at least one opening therein;

an inner mandrel spaced apart from said outer cylindrical sidewall to thereby create an annular space between the exterior of said inner mandrel and the interior of said outer cylindrical sidewall, said inner mandrel having at least one opening therein which communicates the interior of said tubing string with said annular space;

a sliding sleeve located within said annular space having at least one opening therein for communicating said tubing interior, annular space and well annulus, said sleeve being movable between a first position which closes off said mandrel opening from said annular space and a second position in which mandrel opening communicates with said annular space, and through said sidewall opening with the exterior of said tubing string;

a coil spring located in said annular space above said sliding sleeve for initially biasing said sliding sleeve toward said open position;

an annular fluid chamber located below said sliding sleeve and initially containing a substantially incompressible fluid for supporting said sliding sleeve within said annular space in said first position;

frangible means initially containing said fluid within said annular space, said frangible means including a frangible portion which extends within the interior of said tubing string in the path of a weight dropped through said tubing string, whereby a weight dropped within said tubing string severs said frangible portion to release said fluid from said annular space and allow said sleeve to move to said second position; and

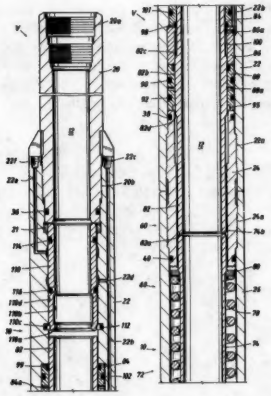
port means for communicating said well annulus with said annular space above said sliding valve, to thereby provide annulus pressure for moving said sliding valve to said open position when said support fluid is released.

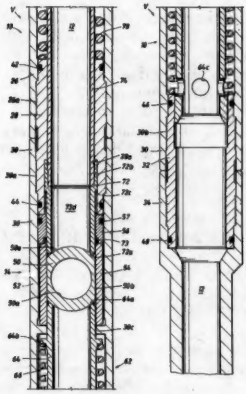
4,603,742

SUBSURFACE SAFETY VALVE

Fred S. Wong, Houston, and Larry F. Grohman, Spring, both of Tex., assignors to Hydril Company, Los Angeles, Calif.

Division of Ser. No. 593,333, Oct. 5, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 740,398
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—374 2 Claims





1. A method of operating a subsurface safety valve in a well having a single pressure responsive surface for operating the valve to the open position for enabling flow including the steps of:

pressurizing a first control fluid conduit communicating with the pressure responsive surface from exteriorly of the well for operating the valve; and

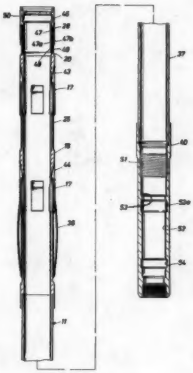
pressurizing a second control fluid conduit communicating with the pressure responsive surface from exteriorly of the well for operating the valve in the event of a malfunction of the first control fluid conduit.

4,603,743

HYDRAULIC/MECHANICAL SETTING TOOL AND LINER HANGER

Hiram E. Lindsey, Jr., Midland, Tex., assignor to MWL Tool & Supply Company, Midland, Tex.

Filed Feb. 1, 1985, Ser. No. 697,231
Int. Cl.[4] E21B *19/10, 43/00*
U.S. Cl. 166—382 32 Claims



1. A liner hanger for use in hanging a liner in a string of pipe in a borehole comprising:

a tubular expander housing having slip expander surfaces disposed circumferentially around said expander housing;

a tubular cage member telescopically received on said expander housing, slip members attached to said cage member and disposed on said expander surfaces, said slip members being movable on said slip expander surfaces from a contracted condition to an extended position relative to the expander housing upon relative movement between said expander housing and said cage member,

said tubular cage member having first internal setting tool locking means in its bore at its upper end; and

said expander housing having means adapted for coupling to a liner and having second internal setting tool locking means in its bore, said first and second internal setting tool locking means being adaptable for cooperation with first and second locking means on a setting tool so that said cage member and expander housing can be releasably held in a contracted conditions relative to one another by a setting tool.

28. A method of setting a liner hanger and attached liner in a wellbore where the liner hanger has expander and slip means releasably held in a contracted condition and movable upon release to an extended condition and said slip means is attached to wall engaging friction means and where a setting tool on a string of tubing is releasably attached to said slips and expander in the liner hanger comprising the steps of:

lowering a liner and liner hanger releasably attached to a setting tool at the end of a string of tubing into a wellbore until the liner engages the bottom of the wellbore;

releasing the slips relative to the expander housing while maintaining the releasable interconnection of the slips and expander with the setting tool;

raising the liner hanger to the location where the liner hanger will be set while maintaining the slips in a retracted condition;

setting the slips by producing relative movement between the slips and expander; and

disconnecting the setting tool from the slips and expander and retrieving the setting tool.

4,603,744

WEED EXTRACTOR DEVICE

Frank L. Ramirez, 1109 S. Lark Ellen, West Covina, Calif. 91791

Filed Nov. 1, 1984, Ser. No. 667,146
Int. Cl.[4] A01B *1/16*
U.S. Cl. 172—25 11 Claims

1. A multi-purpose tool and vegetation extractor, comprising:

an elongated shank having upper and lower end portions,

crank means on the upper end portion of the shank for manual rotation of the tool,

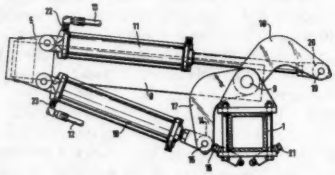
a pair of spaced blades extending longitudinally from the lower end portion of the shank, said blades defining generally wedge-shaped edge portions streamlined in the direction of said rotation to facilitate movement through soil upon said rotation of the tool, each of said blades having a reduced lower end portion for insertion into soil, each of the blades also having a plurality of teeth defined at the leading edges of the blades, at least certain ones of said teeth having upwardly facing tooth faces to engage and retain vegetation wrapped about the blades during said rotation.

4,603,745

PLOUGH REVERSING MECHANISM

Jorn Watvedt, Kvernaland, Norway, assignor to Kverneland A/S, Kvernaland, Norway

Filed Dec. 28, 1984, Ser. No. 687,155
Int. Cl.[4] A01B *63/22, 63/34*
U.S. Cl. 172—212 7 Claims



1. A hydraulic reversing mechanism for a reversible plough comprising:

(a) a plough frame;

(b) a lifting arm having first and second ends, said first end being connected to said plough frame;

(c) a shaft attached to said second end of said lifting arm;

(d) first and second hydraulic cylinders, each having a first end attached to said first end of said lifting arm, and each having a piston rod movably disposed at a second end thereof; and

(e) first and second pressure arms rotatably attached at a first end to said first and second piston rods, respectively, and rotatably at a second end to said shaft;

(f) third and fourth hydraulic cylinders connected in parallel with said first and second hydraulic cylinders, respectively, for adjusting the position of a rear wheel of said plough frame as a function of the position of said first and second hydraulic cylinders;

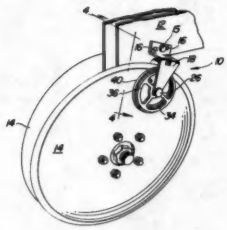
(g) whereby said first hydraulic cylinder initiates rotation of said lifting arm by extending said first piston rod from a retracted position to an extended position, and whereby said second hydraulic cylinder completes rotation of said lifting arm by retracting said second piston rod from an extended position to a retracted position.

4,603,746

DISK BLADE SCRAPER

Barton L. Swales, 1708 E. Fourth St., Coal Valley, Ill. 61240

Filed Jul. 19, 1984, Ser. No. 632,481
Int. Cl.[4] A01B *23/06*
U.S. Cl. 172—559 22 Claims



1. In a scraper mechanism for a disk blade including means for supporting the scraper with respect to the disk blade, said scraper including a hub, a plurality of spokes extending radially from the hub, and a peripheral rim supported by the spokes, the improvement comprising:

a wear ring releasably secured in contacting relationship with said rim, and disposed intermediate said rim and said disk blade, said wear ring being held in planar contact with one side of said disk blade.

4,603,747

APPARATUS FOR REMOVING INTERNAL TILES FROM CHIMNEYS

James M. Golden, P.O. Box 176, Doswell, Va. 23047

Filed Feb. 14, 1985, Ser. No. 701,915
Int. Cl.[4] B23B *45/16;* B08B *1/00*
U.S. Cl. 173—94 8 Claims

1. A heavy duty apparatus for removing the interior tiles from chimneys by rotary impaction comprising:

(a) an electric motor capable of reversing directions of rotation,

(b) a protective frame upon which said motor is mounted,

(c) a drive shaft extending downwardly from said motor to a lowermost extremity,

(d) impact-absorbing clutch means associated with the lowermost extremity of said drive shaft,

(e) an extension shaft axially aligned with said drive shaft, having an upper extremity engaged by said clutch means, and a lowermost extremity,

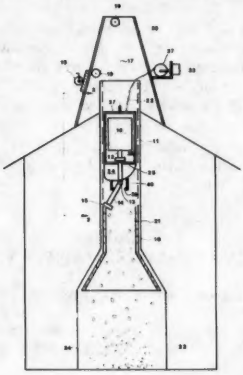
(f) a universal joint associated with the lowermost extremity of said extension shaft,

(g) a pivoted shaft attached to said universal joint and extending downwardly to a lowermost extremity,

(h) weighted impact means associated with the lowermost

extremity of said pivoted shaft and adapted to travel in a circular path extending beyond said frame,

(i) means for vertically lowering and raising said frame, and



(j) electrical control means for starting, stopping and reversing said motor.

4,603,748

HIGH FREQUENCY VIBRATORY SYSTEMS FOR EARTH BORING

Andre M. Rossfelder, La Jolla, and Peter A. Jung, San Diego, both of Calif., assignors to Geomarex, La Jolla, Calif.

Division of Ser. No. 443,069, Nov. 19, 1982, Pat. No. 4,553,443. This application Mar. 12, 1985, Ser. No. 710,916

Int. Cl.[4] E21B *7/26;* **B06B** *1/16*

U.S. Cl. 175—19 **7 Claims**

1. A vibrating system for use in causing a generally vertical pipe to sink into the earth; said system comprising:

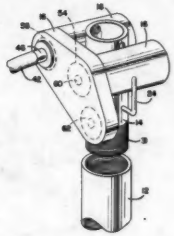
a substantially stationary source of mechanical rotation;

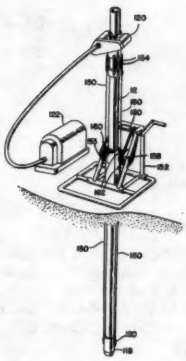
a movable housing particularly adapted for temporary but firm attachment to such generally vertical pipe to transmit vibration at more than 170 hertz to such pipe, and for substantially vertical motion with such pipe through distances of at least several feet while such pipe sinks into the earth;

earth-dissociating means, mounted to the housing, for vibrating such pipe via the housing at more than 170 hertz to dissociate earth particles so that such pipe sinks into the earth;

vertical-motion-accommodating means, interconnecting the substantially stationary source with the earth-dissociating means, for coupling mechanical rotation from the substantially stationary source to power the earth-dissociating means while allowing the housing to move vertically relative to the substantially stationary source; and

a vibration-isolating drive stage, mounted to the movable housing, for transmitting rotation from the vertical-motion-accommodating means to the earth-dissociating means while protecting the vertical-motion-accommodating means and the source from vibration exceeding 170 hertz in the earth-dissociating means and in such pipe.





4,603,749

APPARATUS FOR DOWNWARD DISPLACEMENT OF AN INNER TUBE WITHIN A CORING BARREL

J. Stanley Davis, Sandy, and Steven R. Radford, West Jordan, both of Utah, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Filed Aug. 27, 1984, Ser. No. 644,855

Int. Cl.[4] E21B *10/60, 10/64*

U.S. Cl. 175—250 **6 Claims**

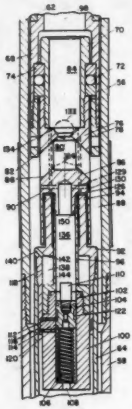
1. An apparatus for providing downward longitudinal displacement in an inner tube with respect to an outer tube in a coring tool comprising:

a cylinder longitudinally fixed with respect to said outer tube, said cylinder having a bypass port defined therethrough and a plurality of conduits defined through said cylinder communicating with the interior of said outer tube to provide a flow path independent of said bypass port through said cylinder, said bypass port having substantially less flow resistance than said plurality of conduits and therefore preferentially diverting hydraulic fluid from said interior of said outer tube above said cylinder to an annular spaced defined between said cylinder and said outer tube;

a primary piston telescopically disposed within said cylinder and forming a sealed and slideable relationship therewith, said piston connected to said inner tube; and

means for selectively closing said bypass port defined in said cylinder to thereby force said hydraulic fluid to flow through said ducts to said interior of said cylinder against

said piston in sealed telescopic relationship with said cylinder,



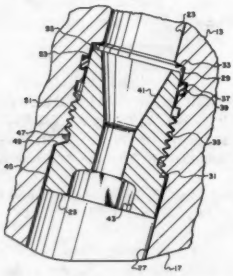
whereby said hydraulic force is applied to said cylinder, and said cylinder is longitudinally displaced downwardly with respect to said outer tube.

4,603,750

REPLACEABLE BIT NOZZLE

Robert B. Sorenson, Houston, Tex., assignor to Hughes Tool Company - USA, Houston, Tex.

Filed Oct. 2, 1984, Ser. No. 656,825
Int. Cl.[4] E21B *10/60*
U.S. Cl. 175—340 **4 Claims**



1. In an earth boring bit having at least one passage for discharging drilling fluid, the improvement comprising in combination:

a lower counterbore section in the nozzle passage extending from the lower end of the passage upwardly, terminating in a downwardly facing lower shoulder;

an upper counterbore section in the passage extending upwardly from the lower shoulder and terminating in a downwardly facing upper shoulder;

a threaded section formed in the upper counterbore section, having its upper end spaced below the upper shoulder a selected distance;

a nozzle having an enlarged lower section for reception in the lower counterbore section and an upper section of smaller diameter for reception in the upper counterbore section, defining an upwardly facing shoulder for sealing engagement with the lower shoulder formed in the bit passage;

the upper section having a threaded section for securing the nozzle to the threaded section formed in the bit passage; and

elastomeric seal means surrounding the nozzle upper section above the threaded section for preventing the entry from above of drilling fluid into the theaded section;

the sealing engagement of the nozzle shoulder with the lower shoulder preventing entry of drilling fluid from below into the threaded section;

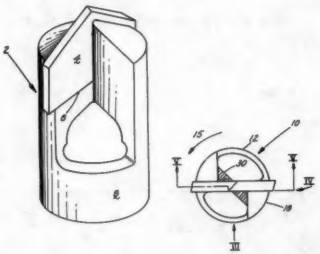
the length of the nozzle upper section being selected so that a clearance exists between the upper end of the nozzle and the upper shoulder when the nozzle is fully made up, assuring sealing contact of the nozzle shoulder with the lower shoulder.

4,603,751

MECHANICALLY FASTENED CENTER VACUUM ROOF DRILL BIT

Robert A. Erickson, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Feb. 16, 1984, Ser. No. 580,825
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—410 **14 Claims**



1. A center vacuum roof drill bit comprising: a body having an axis of rotation, a seat transverse to said axis of rotation, a periphery and a forward working end; at least one flat-like insert positioned on said seat; means for releasably clamping said insert; said means clamping said insert near the periphery of said body and said clamping means comprising two pairs of oppositely facing walls intersecting said periphery, each pair of walls being diametrically opposed from the other, one wall of said each pair of walls extending axially forward from said seat and the other wall being a planar face of a wedge having a rearwardly tapering locking angle, said wedges being adjacent to said seat.

4,603,752

SPEED AND DIRECTION CONTROL APPARATUS FOR A VEHICLE

Gary C. Chambers, Burdett, and Leonard V. Hychalk, Painted Post, both of N.Y., assignors to Figgie International Inc., Willoughby, Ohio

Filed Dec. 12, 1984, Ser. No. 680,941
Int. Cl.[4] B62D *11/04*
U.S. Cl. 180—6.4 **10 Claims**

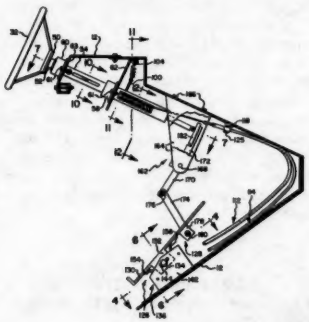
1. Speed and direction control apparatus for a vehicle of the type having a frame, right and left ground engaging wheel means on said frame, right and left motors associated respectively with said right and left wheel means, and right and left variable displacement pumps associated respectively with said right and left motors, each of right and left motors being capable of being driven at varying speeds in forward or reverse directions, and each of the variable displacement pumps being provided with a neutral position to a maximum reverse position to selectively vary the output of said pump between maxi-

mum forward and reverse outputs; said speed and direction control apparatus comprising:

rotatable and telescopic means mounted on said frame, said rotatable and telescopic means including telescopic shaft means capable of being shifted relative to said frame, the rotatable and telescopic means including a rotatable steering column and a shaft, said column being journaled within a portion of the frame for rotation about its axis, and said shaft including a portion mounted within a portion of the steering column for rotational movement with said steering column and also for telescoping movement within the steering column;

mounting means interconnected to said telescopic shaft means for shifting movement therewith and capable of being rotated about an axis upon rotation of said rotatable and telescopic means;

a pair of push-pull cable assemblies, each assembly including a longitudinally movable control cable disposed within a sheath, a first end of each of said sheaths being interconnected to said frame at a first location and a second end of



each of said sheaths being interconnected to said frame at a second location, a first end of each of said control cables being connected to said mounting means in spaced apart locations to either side of said axis in such a manner that when the mounting means is caused to be rotated one of the control cables will be extended relative to its sheath and the other control cable will be retracted relative to its sheath, and a second end of each of said control cables being connected to an associated control arm of a variable displacement pump;

foot pedal means mounted on said frame and including a pedal rockable between forward and reverse positions to either side of a neutral position and pedal centering spring means normally biasing said pedal to its neutral centered position; and

force transmitting means interconnecting said foot pedal means with said telescopic shaft means and capable of shifting the mounting means towards and away from said first location upon corresponding movement of said foot pedal means whereby forward and reverse movement of said control arms can be obtained.

4,603,753

AUTOMATIC RUNNING WORK VEHICLE

Shingo Yoshimura, Sakai; Katsumi Ito, Osaka, and Shigeru Tanaka, Osaka, all of Japan, assignors to Kubota, Ltd., Japan

Filed Dec. 13, 1983, Ser. No. 560,798

Claims priority, application Japan, Aug. 29, 1983, 58-157541; Oct. 5, 1983, 58-187345

Int. Cl.⁴ B62D *1/00*

U.S. Cl. 180—131 **8 Claims**

1. An automatic running work vehicle controllable to follow a series of straight courses for working a surface, comprising:

a body;

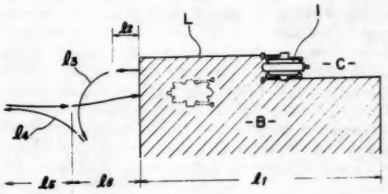
a plurality of steerable wheels;

a plurality of position sensor means mounted transversely on said body for sensing a boundary between worked and unworked areas and for detecting the front and rear ends of said courses;

orientation sensor means mounted on said body for detecting the running direction of said vehicle; and

control means mounted on said body and connected to said position sensor means which detects said front end, rear end of each course and said boundary;

said control means being responsive to the detection of the rear end of one course by said plurality of position sensor means for causing said vehicle to advance the vehicle a



first predetermined distance past the next course at a first predetermined angle, to advance the vehicle at a second predetermined angle a second predetermined distance, and then to advance the vehicle and simultaneously adjust the orientation to match a preselected orientation of said next course;

said control means being further responsive to the detection of the front end of the next course by said plurality of position sensor means for causing said vehicle to translate toward a boundary of the next course without changing its orientation until said boundary is detected and finally return to an original mode in which said vehicle follows the next course upon detection by one of said plurality of position sensor means of the boundary thereof between the worked and unworked areas.

4,603,754

DRIVE SYSTEM FOR ENGINE-DRIVEN LIGHT VEHICLES

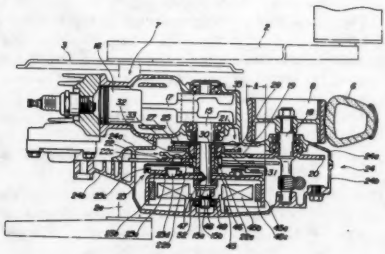
Takushi Matsutoh, Tokyo; Goroei Wakatsuki, Fujimi; Yoshitaka Kitamura, Sakado, and Takeo Ishihara, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,759

Claims priority, application Japan, Aug. 10, 1983, 58-145838; Aug. 22, 1983, 58-152737

Int. Cl.⁴ B62M *7/06*

U.S. Cl. 180—221 **8 Claims**



6. A drive system for use in a light vehicle including an

engine having a crankshaft and a wheel, said drive system including a friction roller disposed for frictional engagement with said wheel for transmitting the rotation of said engine to said wheel, said drive system being adapted to transmit the rotation of said wheel to said engine through said friction roller at the start of said engine, said drive system comprising: a drive shaft extending parallel with said crankshaft, said friction roller being supported on said drive shaft to be rotatively driven thereby; a power transmission means interposed between said drive shaft and said crnakshaft, for transmitting the rotation of said drive shaft to said crankshaft with a given ratio of speed change appropriate for starting said engine; a one-way clutch engaging with said power transmission means and adapted to transmit only the rotation of said drive shaft to said crankshaft, whereby the rotation of said drive shaft is transmitted to said crankshaft through said power transmission means and said one-way clutch at the start of the engine; and a platetary gear assembly coupled to said power transmission means and adapted to transmit the rotation of said crankshaft to said drive shaft through said power transmission means with a given reduction ratio, said planetary gear assembly including a centrifugal clutch disposed on said crankshaft for rotation therewith, said centrifugal clutch being adapted to transmit the rotation of said crankshaft to said drive shaft when the rotational speed of said crankshaft exceeds a predetermined value.

4,603,755

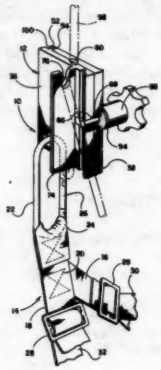
RAPPEL LINE CLAMP AND HARNESS

Juergen Meschke, Atlanta, Ga., assignor to Mar-Mex International, Ltd., Atlanta, Ga.

Filed Feb. 4, 1985, Ser. No. 698,038

Int. Cl.[4] A62B *1/14*

U.S. Cl. 182—5 **4 Claims**



1. A rappel clamp comprising:

a first and a second elongated closely opposed juxtaposed plate, said pair of elongated closely opposed juxtaposed plates including opposing and remote sides, said plates defining corresponding first and second longitudinal marginal portions and corresponding first and second transverse end marginal portions;

a substantially full length open ended groove formed in one of the opposing sides of said first longitudinal marginal portions, said groove being partially cylindrical in transverse section;

an outstanding and at least substantially full length rib in the other opposing side of said first longitudinal marginal portions provided with a transversely enlarged outer longitudinal extremity being slidably received and removable from said groove as well as angularly displaceable therein;

full length opposing and registered longitudinal open ended grooves formed in the opposing sides of said plates;

outwardly opening laterally registered slots formed in said second longitudinal marginal portions;

registered transverse outwardly opening slots formed in said second pair of corresponding longitudinal marginal edge portions, a laterally outwardly opening groove formed in said remote side of said first elongated plate, said outwardly opening groove being open at its opposite ends and being generally keyhole-shaped in cross section, said groove outwardly opening into opposite sides of said transverse registered outwardly opening slot at points spaced outward of the inner extremity thereof;

a clamp screw having a first and a second end, one of said ends including means defining a transverse passage therethrough, a pivot pin inserted lengthwise into said laterally outwardly opening groove to a position with said pin spanning said transverse outwardly opening slots, said one end of said screw being loosely received in the laterally outwardly opening slot with said pin rotatbly received through said passage, the other end of said screw having a hand nut threaded thereon, said screw begin disposed with a mid-portion thereof extending through the other outwardly opening slot and said hand nut opposing the other remote side of said plate; and

an outstanding flange in one of the remote sides of said plates, said outstanding flange extending longitudinally thereof and is slightly laterally spaced from a position registered with said grooves, the end of said flange facing outwardly of one pair of said transverse end marginal portions having an endwise outwardly opening keyhole-shaped notch formed therein and extending transversely therethrough.

4,603,756

METAL PIPE SCAFFOLDING

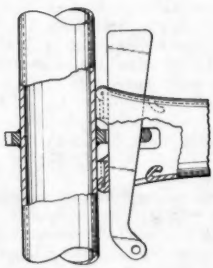
Ulrich Layher, Im Lailen 16, D-7129 Güglingen-Eibensbach, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 633,098

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407425

Int. Cl.[4] E04G *7/30*

U.S. Cl. 182—178 **9 Claims**



1. In a metal pipe scaffolding including vertical scaffold elements formed of cylindrical scaffold pipes locked by wedges, non-vertically extending scaffold elements, and connecting flanges formed of circular discs and provided with bridges for connecting the vertical scaffold elements to non-vertically extended scaffold elements, each non-vertically extending scaffold element being formed of a scaffold pipe by pressing process and having a central plane and including an end portion having deformed wedge-shaped ends which together form a vertically extended straight and smooth supporting surface for supporting a wall of the vertical scaffold element being connected to the non-vertically extended scaffold

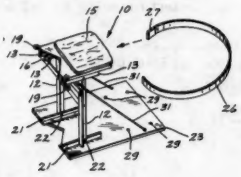
element, said non-vertically extended scaffold element having a front region at said end portion and being formed with at least one slot extended along said central plane and lengthwise of said non-vertically extended scaffold element for engaging therein one of said connecting flanges for connecting the vertical scaffold element, said end portion of the non-vertically extended scaffold element being formed with two diametrically opposite openings for receiving and guiding a respective wedge, said ends being curved inwardly of the non-vertically extended scaffold element and forming deformed rolled-in portions which are connected to each other by a vertical weld seam, said rolled-in portions defining said supporting surface in a horizontal direction as a concavely curved surface which has a radius which corresponds to an outer radius of the pipe of the vertical scaffold element.

4,603,757

TREE STAND

Brian L. Hollinger, 5316 S. 93rd St., Ralston, Nebr. 68127

Filed Nov. 29, 1984, Ser. No. 676,167
Int. Cl.[4] E04G *3/100*
U.S. Cl. 182—187 **9 Claims**



9. A tree stand comprising:

a frame adapted to be substantially vertically disposed along a tree trunk;

a first tree trunk engaging means attached to a top portion of said frame for engaging a tree trunk at a first vertical level, said first tree trunk engaging means comprising a pair of elongated members pivotally attached intermediate the ends thereof to a top portion of said frame;

a second tree engaging means for engaging said tree trunk at a second vertical level;

fastening means extending around a tree trunk for attaching an upper portion of said frame to the tree trunk;

platform means rigidly attached to said second tree engaging means for permitting a person to stand on said platform when it is disposed in a horizontal disposition;

pivot means for pivotally attaching said second tree engaging means and thereby said platform means to a lower portion of the frame along a substantially horizontal axis, for permitting said second tree engaging means to be movable between a first position in contact with the tree trunk substantially below said horizontal axis and a second position in contact with the tree trunk substantially at the same level as said horizontal axis, said second tree engaging means extending a substantial distance from said horizontal axis whereby pivoting of said platform and said tree engaging means from said first position to said second position causes said frame to be forced outwardly from the tree trunk, thereby tightening the fastening means and causing the tree stand to be more tightly secured to said tree trunk;

stop means operatively attached to said platform preventing said platform from pivoting downwardly beyond a substantially horizontal position;

seat means attached to the end of said elongated members opposite a tree abutting portion of the elongated members; and

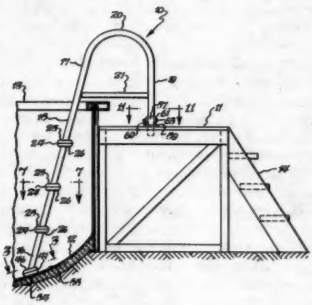
brace means removably attached to said tree abutting portion and to an intermediate part of the frame whereby the seat and first tree abutting portion is selectively secured in a substantially horizontal position for use or, when said brace means is disconnected from said elongated members, said seat and said elongated members can be folded compactly for transportation from place to place.

4,603,758

LADDER CONSTRUCTION

Frederick M. Pettit, 1411 Point Abino Rd. S., Ridgeway, Ontario, Canada L0S 1N0

Filed Jan. 4, 1985, Ser. No. 688,766
Int. Cl.[4] E06C *7/08, 9/02*
U.S. Cl. 182—194 **13 Claims**



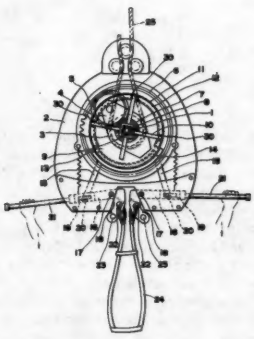
1. A ladder comprising a pair of spaced rails, a plurality of spaced rungs each having a central portion and integral opposite end portions and upper and lower sides, holes extending through said end portions and through said upper and lower sides for receiving said rail, pins extending through said rails and having outer end portions extending beyond said rails, and slot means in said rungs extending outwardly from opposite sides of each of said holes and extending inwardly into said rungs from said lower sides on opposite sides of each of said holes and terminating at bearing areas within said rungs for receiving said outer end portions of said pins with said bearing areas bearing on said outer end portions of said pins.

4,603,759

FIRE ESCAPE DESCENDER

Akio Hamada, 3-8-10, Momoyamadai, Tarumiku, Kobe, Japan

Filed May 20, 1985, Ser. No. 735,937
Claims priority, application Japan, Jan. 28, 1985, 60-11010[U]
Int. Cl.[4] A62B *1/10*
U.S. Cl. 182—234 **4 Claims**



1. A fire escape descender, comprising:

a base member including a shaft fixed to the base member,

a rotating member rotationally disposed on the shaft, said rotating member being adapted to engage a rope so that the rope and the rotating member are associated together,

a gear mechanism connected to the rotating member to allow the gear mechanism to rotate together with the rotating member,

automatic brake means including a brake drum connected to the base member, a brake actuating member connected to the gear mechanism to rotate together with the gear mechanism, and a brake shoe engaging the brake actuating member so that as the brake actuating member rotates faster, frictional engagement of the brake shoe relative to the brake drum increases,

manual brake means including a brake disc connected to the rotating member to rotate together with the rotating member, and a hand brake shoe movably fixed to the base member adjacent to the brake disc,

manual brake actuating means pivotally connected to the hand brake shoe and including a pair of handle sections, each having a handle and a crooked portion connected to the handle, said crooked portions being pivotally connected to the base member to face relative to each other so that when the handles are lowered down, the hand brake shoe is moved away from the brake disc,

a body support member connected to the crooked portions so that when an escaper is held by the body support member, the manual brake actuating means is automatically operated to engage the hand brake shoe to the brake disc to stop moving of the escape descender relative to the rope until the hand brake shoe is released from the brake disc by operating the handle sections, and

a descender support member connected to the crooked portions so that when the escape descender is hung by means of the descender support member, the hand brake shoe is released from the brake disc to thereby control movement of the rotating member and the rope only by the automatic brake means.

4,603,760

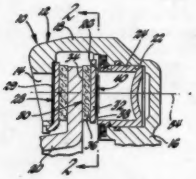
SLOTTED INSULATOR AND DISC BRAKE ASSEMBLY USING SAME

William K. Myers, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1985, Ser. No. 772,029

Int. Cl.[4] F16D *65/38, 65/78*

U.S. Cl. 188—73.37 **14 Claims**



1. In a disc brake shoe assembly having a backing plate, a friction pad secured to one side of said backing plate and an insulator formed as a layer and secured to the other side of said backing plate, said insulator having a high pressure area of disc brake actuating member contact subject to high pressure loading during brake actuation, with a portion of said insulator positioned laterally from said high pressure area and subject to no direct pressure loading from the disc brake actuating member during brake actuation:

an arrangement preventing deformation of the insulator because of high pressure loading of said high pressure area by the disc brake actuating member during brake actuation and consequent buckling and detachment of at least a portion of said insulator from said backing plate which results in a decreased insulating function of said insulator, said arrangement comprising:

at least one slot formed through said insulator immediately adjacent but laterally away from said high pressure area, said at least one slot providing a discontinuity in the deformation of the insulator caused by high pressure loading and permitting said laterally away portion of said insulator to remain secured to the backing plate.

4,603,761

FLOATING CALIPER TYPE DISC BRAKE

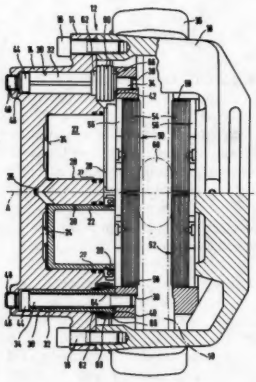
Röhling Bernd-Holger, Andernach, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England

Filed Aug. 14, 1984, Ser. No. 640,798

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 8323802[U]

Int. Cl.[4] F16D *65/02*

U.S. Cl. 188—73.45 **1 Claim**



1. A spot type disc brake, comprising a floating caliper **(12)** supported for displacement on a carrier **(36)** by a pair of guide pins **(32)** and corresponding guide bores **(30)** and straddling a pair of brake pads **(50, 52)** one of which is adapted to be pressed into contact with a brake disc **(10)** directly by a brake actuator **(20, 22)** and the other one by displacement of the caliper **(12)** caused by the brake actuator, and comprising sealing members **(60)** for sealing the sliding surfaces of each guide pin **(32)** and the corresponding guide bore **(30)** from the outside, each guide pin **(32)** comprising a collar **(66)** in the area of the respective end of the guide pin **(32)** extending from the guide bore **(30)** toward the brake disc **(10)**, characterized in that the collars **(66)** form stops which limit the inward movement of th directly operable brake pad **(50)** in a direction toward the brake actuator, each collar being located relative to the end of a guide pin in a position to protect a respective sealing member **(60)** against damage which might otherwise be caused by the back-plate **(56)** of the brake pad **(50)** during said inward movement thereof.

4,603,762

WHEEL CYLINDER HAVING AN AUTOMATIC CLEARANCE ADJUSTING MECHANISM

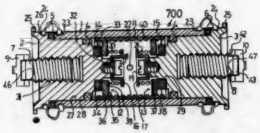
Shoji Kajihara, Fujisawa, Japan, assignor to Tokyo-Buhin Kogiyo Co., Ltd., Yamato, Japan

Filed Oct. 25, 1984, Ser. No. 664,814

Claims priority, application Japan, Dec. 28, 1983, 58-199453[U]; Dec. 28, 1983, 58-199454

Int. Cl.[4] F16D *51/00*

U.S. Cl. 188—79.5 R 4 Claims



1. A wheel cylinder having an automatic clearance adjusting mechanism for a drum brake having two pistons arranged to move in axially opposed relation to each other to actuate corresponding shoes of the drum brake, comprising movable guide gears which are rotatable and movable axially with respective ones of said pistons, a fixed guide gear engaged with and adapted to rotatably urge said movable guide gears in response to axial movement of the movable guide gears with the pistons, clutches on said pistons, said clutches contacting respective said guide gears with a mutual pressing force to (1) allow partial rotation of said movable guide gears with respect thereto and (2) require rotation of said pistons with said movable guide gears in one direction when the amount of outward movement of the pistons exceeds a specified value, threaded bars threadedly engaging the respective pistons and responsive to said rotation of said pistons for threaded movement axially in said pistons, and clamping means engaging the corresponding shoe webs and responsive to said threaded relative movement of said pistons and said threaded bar to thereby adjust excess clearance between the shoes and the interior surface of the brake drum.

3. A wheel cylinder having an automatic clearance adjusting mechanism for a drum brake having two pistons arranged to move in axially opposed relation to each other to actuate corresponding shoes of the drum brake, comprising a movable guide gear which is rotatable and movable axially with a respective one of said pistons, a fixed guide gear engaged with and adapted to cause said movable guide gear to rotate in response to relative axial movement of the pistons, a clutch on said one piston, said clutch contacting said guide gear with a mutual pressing force to (1) allow partial rotation of said movable guide gear with respect thereto and (2) require relative rotation of said movable guide gear with respect to said pistons in one direction when the amount of outward movement of the pistons exceeds a specified value, threaded bar threadedly engaging said one piston and responsive to the movement of said pistons for threaded rotational movement axially in said one piston, and clamping means engaging the corresponding shoe webs and responsive to said threaded relative movement of said piston and said threaded bar to thereby adjust excess clearance between the shoes and the interior surface of the brake drum.

4,603,763

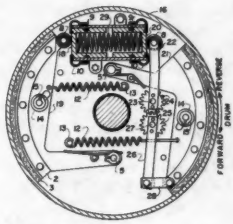
DRUM BRAKE WITH NEGATIVE FEEDBACK FOR BRAKE SHOE FRICTION COMPENSATION

Stanley J. Mikina, Rte. 2 Berna-Knoll 21, Hendersonville, N.C. 28739

Filed Sep. 25, 1984, Ser. No. 654,223

Int. Cl.[4] F16D *51/24*

U.S. Cl. 188—334 1 Claim



1. A friction brake comprising a rotatable drum, two brake shoes, having linings, each of less than 360° arc and pivoted on pivots on a stationary backplate substantially diametrically opposite each other, the pivots located so as to produce negative feedback moments about the pivots of the sliding friction forces between shoes and drum at both brake shoes in forward rotation of the drum, means for limiting positive feedback moments about the pivots for reverse drum rotation, and a single hydraulic cylinder for applying actuating hydraulic forces on substantially diametrically opposite brake shoe ends including a force transfer linkage for applying the hydraulic force of one piston to the remote shoe end of the corresponding brake shoe, said force transfer linkage comprising levers with engaging gears for reversing the direction of lever rotation, an anti-friction bearing at the said one piston end, and a connecting link between the force transfer levers and the shoe at the toe of said remote shoe end.

4,603,764

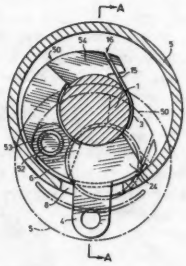
BRAKE ACTUATOR FOR BICYCLES AND THE LIKE

Winnett Boyd, 107 Victoria Place, R. R. No. 1, Bobcaygeon, Ontario, Canada K0M 1A0

Filed Nov. 23, 1984, Ser. No. 674,292

Int. Cl.[4] B62L *5/00*

U.S. Cl. 192—5 4 Claims



1. In a device for operating a brake of a pedal operated vehicle, which device comprises a brake operating lever projecting through an opening in a pedal crankshaft housing of the vehicle, two oppositely wound spring coils connected at a bight and concentrically surrounding and frictionally engaging a pedal crankshaft within the housing, and a yoke at an inner end of the lever, said yoke surrounding part of the circumfer-

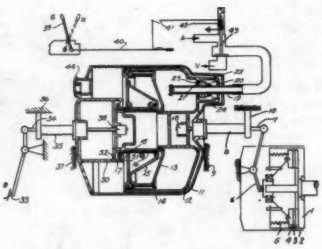
ence of the crankshaft, the improvement wherein a linking means is provided, with a pivotal connection at its one end to the yoke and a connection at its other end to the bight, wherein the yoke and the linking means together surround at least half of the circumference of the crankshaft, wherein the linking means has a friction surface engageable at least with an area of the crankshaft diametrically opposed to the yoke, wherein the bight engages the linking means at a location radially outward of the friction surface and so that the spring coils extend from the bight around the crankshaft in the same direction as the linking means extends from the yoke, namely in the direction of motion of the crankshaft associated with back pedalling, and wherein the lever, the yoke and the linking means of the device are so dimensioned that in its plane of operation it can be folded at the pivotal connection so that it has no dimension greater than the internal diameter of the pedal crankshaft housing but when the yoke partially surrounds the crankshaft an arm of the lever projects through the opening in the housing beyond its outer surface.

4,603,765

MEANS FOR MAINTAINING CLUTCH DISENGAGEMENT WHERE TRANSMISSION IS NEUTRAL

Hermanus G. M. Cruijsen, Mierlo, Netherlands, assignor to Volvo Car B.V., Netherlands

Filed Jul. 2, 1984, Ser. No. 627,074
Int. Cl.[4] B60K *41/22*; F16D *25/00*
U.S. Cl. 192—85 V **7 Claims**



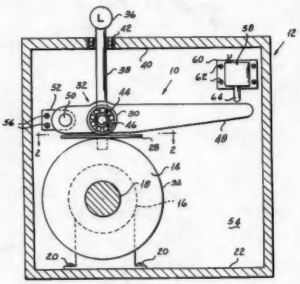
1. In a vehicle having a transmission, a transmission control lever and a mechanical clutch with a manually operable foot control pedal, means for maintaining the vehicle's clutch disengaged while the vehicle is stationary and the transmission is in neutral, said means comprising: a pair of cylinders mounted for reciprocation within said housing; one of said cylinders being mounted within the other and forming a chamber between them; first linkage means connecting said pair of cylinders to said clutch whereby the spring of the clutch holds both of said cylinders toward one end of said housing when the clutch is engaged and said transmission is in gear; second linkage means connecting said clutch pedal to said cylinders; a valve element connected to the transmission control lever; said valve element connecting said chamber to a source of vacuum only when said lever is shifted to place the transmission in neutral; a compression spring interconnecting said second linkage means and the inner one of said cylinders and urging said inner cylinder toward the other end of said housing and said clutch pedal into erected position and expanding said chamber when said clutch is engaged; said inner cylinder being vacuum shifted toward said other end of said housing and compressing said spring to erect said clutch pedal, the vacuum holding the cylinder toward said other end and said clutch disengaged so long as said transmission control lever remains in neutral position.

4,603,766

LEVER OPERATED FRICTION CLUTCH

Benzion Landa, 10045 118th St., Edmonton, Alberta, Canada T5K 1Y1

Filed Aug. 31, 1984, Ser. No. 646,235
Int. Cl.[4] F16D *23/12*
U.S. Cl. 192—99 S **10 Claims**



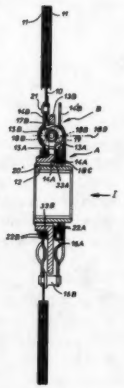
1. A clutch for coupling a prime mover to a load including in combination a first member connected to said prime mover for movement therewith, a second member connected to said load for movement therewith, said first and second members having respective first and second hard surfaces having a low coefficient of friction therebetween, means mounting said members relative to each other with said surfaces in contact, said surface coefficient of friction being such that said second surface slides relative to said first surface with said prime mover in operation without being driven thereby, said second member having a third surface opposite to said second surface, a third member in contact with said third surface, and actuatable means for exerting a force on said third member.

4,603,767

CLUTCH PLATE HAVING TWO STAGE TORSION DAMPING MEANS

Marcel Blond, Savigny-le-Temple, France, assignor to Valeo, Paris, France

Filed Sep. 11, 1984, Ser. No. 649,289
Claims priority, application France, Sep. 14, 1983, 8314609
Int. Cl.[4] F16D *3/44*
U.S. Cl. 192—106.2 **12 Claims**



1. A clutch plate for a friction clutch, said clutch plate comprising a friction disc having friction facings bn opposite

sides thereof and a hub, said friction disc and said hub being mounted for relative angular displacement within a predetermined range, first and second stage torsion damping means coupling said hub and friction disc together, the first stage damping means being lower rated than the second stage damping means, each of said first and second stage damping means comprising a radial flange, two guide washers fixed to each other and disposed on axially opposite sides of the associated flange, resilient means circumferentially interposed between each of said flanges and its associated guide washers, said first stage damping means being operative between said hub and said second stage damping means, said fricton disc being fixed to one of said second stage guide washers, means fastening said first stage guide washers to said second stage damping means, said first stage damping means comprising a unit pre-assembled with said hub and being disposed within the confines of said second stage damping means.

4,603,768

APPARATUS FOR TRANSPORTING PAPER STACKS

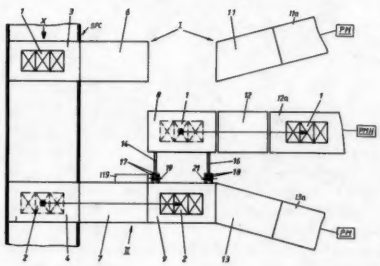
Robert Deutschle, Bokholt-Hanredder, Fed. Rep. of Germany, assignor to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,193

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303712

Int. Cl.[4] B65G *47/10*

U.S. Cl. 198—369 **17 Claims**



1. Apparatus for transporting stacked sheet-like commodities, particularly paper stacks, from a first station to a second station, particularly from a processing station to a packing station, comprising first and second elongated transporting units respectively including first and second supplying conveyors, first and second intermediate conveyors respectively arranged to receive commodities from said first and second supplying conveyors, and spaced apart first and second receiving conveyors respectively arranged to accept commodities from said first and second intermediate conveyors; means for separably locking said intermediate conveyors to each other for joint movement substantially transversely of said transporting units; powered means for engaging and disengaging said locking means; drive means for moving at least one of said intermediate conveyors transversely of said transporting units; and a third receiving conveyor between said first and second receiving conveyors, each of said intermediate conveyors being movable from a position of register with the supplying and receiving conveyors of the respective transporting unit to a position of register with said third receiving conveyor, said intermediate conveyors being jointly movable between a first end position in which the first intermediate conveyor registers with said first receiving conveyor and the second intermediate conveyor registers with said third receiving conveyor, and a second end position in which said first intermediate conveyor registers with said third receiving conveyor and said second intermediate conveyor registers with said second receiving conveyor, said locking means being disengageable by said powered means to allow for independent movements of said first and second intermediate conveyors into register with said first and second receiving conveyors, respectively.

4,603,769

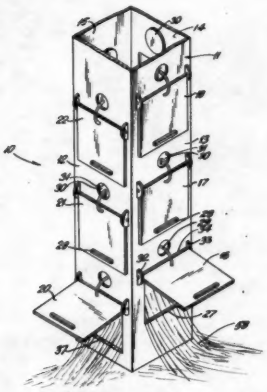
GRAIN CHUTE SYSTEM

Bert Bach, 270 West End Ave., New York, N.Y. 10023, and David Bach, 34 Park Ln., Minneapolis, Minn. 55416

Filed Jul. 16, 1984, Ser. No. 631,099

Int. Cl.[4] B65G *11/06, 11/00, 1/00*

U.S. Cl. 193—12 **9 Claims**



1. A grain chute for a silo, the silo being adapted to receive, store and discharge grain, which grain when received contains dust;

the grain chute comprising:

orifice means to receive grain received into the silo;

chute means connected to said orifice means to vertically conduct the grain, said chute means extending from the orifice means to near the bottom of the silo, said chute means consisting of an elongated vertically oriented hollow conduit;

a plurality of door ports in said conduit arranged one above the other for the height of the conduit, and a door associated with each door port;

each of said doors having an air port valve means and the chute means having a plurality of air ports, with each air port of the chute means being closeable by the door valve means when the door is closed and being openable by said door valve means when said door is opened;

door balance means connected to each door to open the said door when the height of the grain in the conduit reaches the said door, so that the grain exits from the chute means only at the lowest door at the level of the grain in the silo and the doors above that opened door remain closed; and

exhaust means to exhaust dust from the conduit while permitting the fall of the grain within the conduit.

4,603,770

RAKE CONVEYOR APPARATUS

Thomas S. Hartness, Rte. 12, Paris Mountain, Greenville, S.C. 29609

Filed Jan. 18, 1984, Ser. No. 571,678

Int. Cl.[4] B65G *25/10*

U.S. Cl. 198—345 **24 Claims**

1. A rake conveyor apparatus for conveying containers and the like on a container packing machine, said apparatus comprising:

frame means for supporting said apparatus above a surface of a floor;

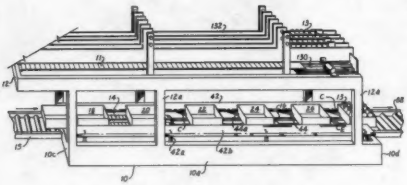
a conveyor platform carried by said frame means on which said containers are supported for conveyance along a conveyor path;

reciprocating elongated rake means carried by said frame means adjacent said conveyor platform;

said elongated rake means having a forward stroke for advancing said containers along said conveyor path and a return stroke which returns said elongated rake means without container engagement;

actuation means for reciprocating said rake means in a reciprocating motion between a forward and return position;

spaced movable rake dog means carried by said rake means at spaced locations along the length of said rake means and



mounted for pivotal movement relative to said rake means between a non-engaging container position and a container engaging position for engaging said containers;

said rake dog means moving to a container engagement position upon said forward stroke of said rake means to engage said containers and advance said containers incrementally to selected positions along said conveyor path;

motion limiting means contacting said rake dog means as said rake dog means moves between said engaging position and said non-engaging position for initially limiting to linear motion the movement of said rake dog means during the return stroke while said rake dog means contacts said motion limiting means.

4,603,771

SORTING INSTALLATION FOR PIECE GOODS

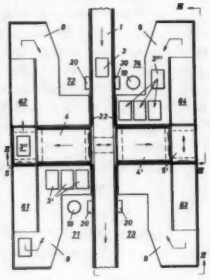
Christian Felder, Dreieichenhain, Fed. Rep. of Germany, assignor to Gebhardt Fördertechnik GmbH, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,863

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215160

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—367 **16 Claims**



1. A sorting installation for piece goods, comprising a main conveyor means, a cross conveyor means arranged in the main conveyor means, auxiliary conveyor means connected to the cross conveyor means, reversibly drivable distributor conveyor means disposed at and extending substantially perpendicular to the outlet of the auxiliary conveyor means, opposite ends of said distributor conveyor means being connected with respective sorting stations by intermediate track means, delivery conveyor means coordinated in common to said sorting stations, and feed conveyor means disposed between the sorting stations and said delivery conveyor means, said delivery conveyor means being disposed substantially directly underneath the main conveyor means and said feed conveyor means being disposed substantially directly underneath said auxiliary conveyor means.

4,603,772

SHIFTING DEVICE FOR OBJECTS, SUCH AS EGGS, TO BE HANDLED

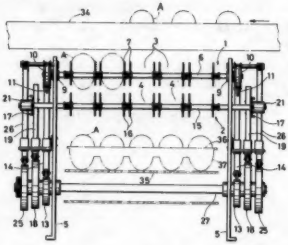
Hiroshi Tomosue, 1855, Shimoyokono, Tuyama City, Okayama Prefecture, Japan

Filed Sep. 7, 1984, Ser. No. 648,219

Claims priority, application Japan, Nov. 7, 1983, 58-209583

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—424 **2 Claims**



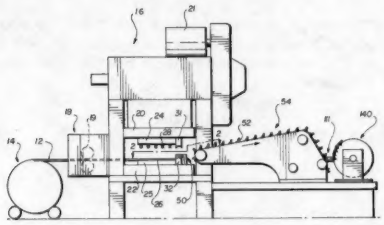
1. A shifting device for objects, such as eggs, which shifting device is between a discharge conveyor above said shifting device and a receiving conveyor belt said shifting device, said shifting device comprising upper and lower delivery devices spaced vertically in alignment, one above the other, between said conveyors, each of said delivery devices having a pair of parallel spaced rods extending horizontally and parallel to said conveyors, each of said rods having a plurality of support segments juxtaposed and spaced at intervals along said rods, said segments on one of said parallel spaced rods being aligned with said segments on the other of said parallel spaced rods, the aligned pairs of segments on said parallel spaced rods forming said upper and said lower delivery devices forming seats for receiving said objects to be shifted from said discharge conveyor above said shifting device to said receiving conveyor below said shifting device, means for mounting said upper delivery device in fixed position vertically below the discharge end of said discharge conveyor and for mounting said lower delivery device vertically below said upper delivery device and above the receiving end of said receiving conveyor, said mounting means including means for moving said lower delivery device vertically upward toward said upper delivery device for shifting an object in the seat of said upper delivery device to the aligned seat of the lower delivery device and for moving said lower delivery device vertically downward toward said receiving conveyor for shifting an object in the seat of said lower delivery device to said receiving conveyor, means for moving said parallel spaced rods of said upper delivery device outwardly parallel to each other for opening said seats of said upper delivery device for shifting objects in said seats of said upper delivery device to the seats of said lower delivery device when said delivery device is moved vertically upward toward said upper delivery device for said object shifting and for returning said spaced rods parallel inward to close said seats after said objects are shifted and said lower delivery device is moved vertically downward and means for moving said parallel spaced rods of said lower delivery device

outwardly parallel to each other for opening said seats of said lower delivery device when said lower delivery device is moved vertically downward toward said receiving conveyor for shifting said objects in said seats of said lower delivery device to said receiving conveyor and for returning said spaced rods of said lower delivery device parallel inward to close said seats after said objects are shifted and said lower delivery device is moved vertically upward, said means for opening and closing of said seats on said upper and lower delivery devices and said means for moving said lower delivery device vertically including eccentric cams mounted on a common rotary shaft for coaxial rotation.

4,603,773
APPARATUS FOR ASSEMBLING BLOWER WHEEL BLADES

John S. Ducate, Sr., 129 Brook Valley Rd., Columbia, S.C. 29204

Filed Jun. 29, 1983, Ser. No. 509,108
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—468.2 **8 Claims**



1. A blade assembling apparatus for engaging individual elongated blades provided by a blade forming means and assembling a plurality of said blades in a predetermined spaced relationship for securing the blades together to form a centrifugal blower wheel, said apparatus comprising:

blade fixture means for receiving and holding said blades in a predetermined spaced relationship corresponding to the blade spacing in said blower wheel;

conveyor means for conveying said blades from said forming means to said fixture means;

transfer means for transferring individual blades from said forming means to said conveyor means and from said conveyor means to said fixture means; and,

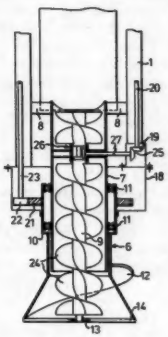
drive means for positioning said conveyor means so as to receive each of said blades from said transfer means and for positioning said fixture means so as to receive each of said blades from said transfer means;

said blade fixture means including at least one holding disc in coaxial relation about a central axis of said fixture means, said holding disc having a plurality of radial projections forming circumferentially spaced slots extending along the periphery of said holding disc so as to receive an inner edge of said blades when said blades are transferred from said conveyor means to said fixture means, resilient means carried by each of said projections and extending into at least a portion of each of said slots, at least one pressure disc adjacent to said holding disc in a coaxially spaced relation about said central axis and having a plurality of radially projecting pressure fingers extending along the periphery of said pressure disc and positioned for overlapping said holding slots, said holding disc and said pressure disc being rotatable relative to each other about said central axis between a first position in which said pressure fingers overlap at least a portion of said holding slots so as to press blades inserted in said holding slots against said resilient means and cause said resilient means to exert a holding pressure on said blades, and a second position in which said overlap provided by said pressure fingers is reduced by an amount sufficient to release said holding pressure and permit removal of said blades from said holding slots.

4,603,774
VERTICAL CONVEYOR FOR BULK GOODS

Olle L. Siwersson, Helsingborg, and Arne E. Wall, Landskrona, both of Sweden, assignors to AB Scaniainventor, Helsingborg, Sweden

Continuation-in-part of Ser. No. 323,796, Nov. 23, 1981, Pat. No. 4,467,910. This application Jul. 16, 1984, Ser. No. 631,184
Claims priority, application Sweden, Nov. 28, 1980, 8008347
The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.
Int. Cl.[4] B65G *65/16*
U.S. Cl. 198—518 **10 Claims**

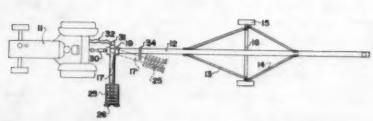


1. A bulk material conveyor comprising a belt conveyor forming a tube in which the bulk material is conveyed in an upward direction from an entrance end at a lower portion of the belt conveyor, a downwardly directed screw conveyor fixedly mounted on the lower portion of the belt conveyor, said screw conveyor having its delivery opening directly connected onto the entrance end of said tube, and a material supplying device at the entrance opening of said screw conveyor, wherein a housing of said screw conveyor is rigidly connected to a frame of said belt conveyor, wherein a screw of said screw conveyor is rotatably mounted, and wherein a pinion is driven by a motor spaced from the entrance end of said belt conveyor for rotating gear means connected to the screw of said screw conveyor.

4,603,775
COUPLING GRAIN AUGERS

Benjamin Plett, Rosenort, Canada, assignor to Westfield Industries Ltd., Rosenort, Canada

Filed Feb. 18, 1983, Ser. No. 467,656
Int. Cl.[4] B65G *33/32*
U.S. Cl. 198—589 **6 Claims**



6. An auger arrangement comprising a main auger including an auger tube having a feed end and a discharge end, means for supporting the auger tube at an inclination to the horizontal and to alter the elevation of the discharge end, a rotatably

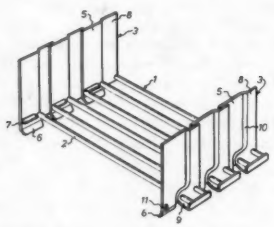
mounted helical auger flight within the tube for transporting particulate material within the tube from the feed end to the discharge end, the flight including an exposed portion at said feed end which projects outwardly from the tube and ground wheels said supporting means; rigid casing means substantially surrounding and enclosing the exposed portion of the flight having closed side walls and an upper wall extending over said exposed portion, means rigidly mounting said casing means on said tube, said upper wall defining an opening which directly vertically overlies said exposed portion for receiving said particulate material therethrough for flowing by graviy on to said exposed portion; a feed auger including an auger tube having a feed end and a discharge end and a rotatably mounted helical auger flight within the tube for transporting particulate material within the tube from the feed end to the discharge end, hopper means at the feed end of the feed auger, a downwardly depending discharge spout at the discharge end of the feed auger and coupling means for mounting said spout on said upper wall, said coupling means comprising a first sleeve coupling portion surrounding the spout which allows rotational movement of the spout relative to the upper surface about a first axis longitudinal of the spout, a first pivot ring coupling portion surrounding said spout and providing pivotal movement of said spout relative to said upper surface about a second axis transverse to said spout, and a second pivot ring coupling portion surrounding said spout and providing pivotal movement of said spout relative to said upper surface about a third axis transverse to said spout and transverse to said second axis, said coupling portions being arranged to maintain said spout against lateral shifting relative to said opening while allowing rotational movement relative thereto about said three axes, whereby said spout extends into said opening for direct unhindered discharge of material onto said exposed portion.

4,603,776

CONVEYOR BELT

Lennart Olsson, Nyhamnsläge, Sweden, assignor to Frigoscandia Contracting AB, Sweden

Filed Nov. 22, 1983, Ser. No. 554,346
Claims priority, application Sweden, Nov. 26, 1982, 8206760
Int. Cl.[4] B65G *21/18*
U.S. Cl. 198—778 **6 Claims**



1. In a conveyor of the type having an endless belt following a path which through part of its length includes a number of superposed, helically extending turns and wherein the belt comprises a plurality of link means of generally U-shaped cross sections which are articulated with one another and relatively adjustable and which respectively include spacing members arranged at opposite lateral ends of a corresponding part of the bottom of the belt, the spacing members each having a substantially upright portion and a laterally extending support portion at the base of the substantially upright portion, the respective support portions of spacing members of link means in overlying turns of the belt being supported upon upper edge portions of the respective substantially upright portions of spacing members of link means in underlying turns of the belt, whereby each overlying turn is supported upon underlying turn, the improvement wherein:

(a) each said spacing member includes a first longitudinal portion and a second longitudinal portion integral with said first longitudinal portion, said first and second longitudinal portions including, respectively, first and second sections of the substantially upright portion of said spacing member,

(b) said first and second sections are longitudinally displaced and laterally offset from one another,

(c) said first longitudinal portion is fixedly connected at two longitudinally spaced points to the corresponding bottom part, said second longitudinal portion being movable relative to the bottom of the belt,

(d) the support portion of said spacing member extends laterally from said first longitudinal portion of said spacing member, and

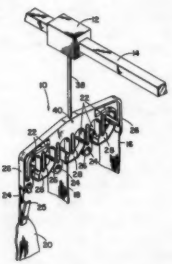
(e) the respective second sections of the upright portions of spacing members on at least one side of said belt have respective flanges projecting downward and laterally inward of said belt, said flanges being disposed to engage respective upper edge portions of the substantially upright portions of underlying spacing members and thereby prevent lateral displacement of the turns of said belt.

4,603,777

CONVEYOR HANGER WITH SPRING CLIP GRIPPER

David R. Pearl, and Lawrence S. Wolfson, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Sep. 17, 1984, Ser. No. 651,424
Int. Cl.[4] B65G *47/74*
U.S. Cl. 198—803.8 **4 Claims**



1. A hanger for use in a conveyorized system for transporting limp sheet material from work station to work station, said hanger comprising a body having an upper portion and a first portion extending downwardly from said upper portion and a second portion extending downwardly from said upper portion in laterally spaced relation to said first downwardly extending portion, and a gripper associated with said body for releasably holding a unit of work material, said gripper comprising a generally vertically extending stationary gripping surface on said first downwardly extending body portion, said stationary gripping surface generally facing said second downwardly extending body portion and having a curved lower end portion curving somewhat toward said second downwardly extending body portion so as to have an upwardly facing component, and an elongated spring clip attached at a given point along the length thereof to the lower end of said second downwardly extending body portion, said lower end of said second downwardly extending body portion and said point at which said spring clip is attached thereto being located below said curved lower end portion of said gripping surface and said clip having an inclined portion bridging the space between said downwardly extending body portions which inclined portion extends upwardly from its said point of attachment to said lower end of said second downwardly extending body portion and toward said curved lower end portion of said gripping surface on said first downwardly extending body portion, said clip further having a curved end portion adjacent said inclined

portion which curved portion has a curvature generally matching that of said curved end portion of said stationary gripping surface, said clip being further of such size and shape that said curved end portion thereof at least nearly engages said curved end portion of said fixed gripping surface when no work unit is inserted in said gripper, said spring clip being made of a resilient spring material so as to resiliently resist movement of said curved end portion of said clip away from said curved end portion of said fixed gripping surface, the inclination of said inclined portion of said clip upward from its point of attachment to said first downwardly extending body portion and toward said gripping surface causing a downward force exerted on said curved end portion of said clip by a unit of work material inserted between said curved end portion and said gripping surface to urge said curved end portion toward said gripping surface to more tightly grip said unit of work material, and said inclination of said inclined portion further causing an upwardly directed force exerted on said inclined portion during the upward insertion of a unit of work material into said gripper to urge said curved end portion of said clip away from said gripping surface to ease said insertion.

4,603,778

DETECTION OF DEFECTS IN CONVEYOR BELTS

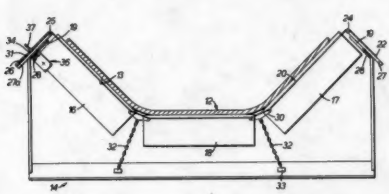
Dennis W. Thompson, 19 Gandawarra Crescent, Newman, Western Australia, Australia, assignor to Dennis W. Thompson, Newman, Australia

Continuation of Ser. No. 671,021, Nov. 13, 1984, which is a continuation of Ser. No. 435,411, Oct. 20, 1982. This application Oct. 23, 1985, Ser. No. 790,419

Claims priority, application Australia, Oct. 26, 1981, PF1295

Int. Cl.[4] B65G *43/02, 43/06*

U.S. Cl. 198—810 **11 Claims**



1. In a belt conveyor installation, apparatus for detecting a defect in the conveyor belt when it is moving, comprising line holding means for holding a line substantially taut in a position extending across and in close proximity to a surface of the conveyor belt, which surface moves past the line during operation of the conveyor; and

trigger means, responsive both to loss of tension and to increased tension in said line caused by disturbance of the line by a protrusion from said surface arising from said defect, for initiating a reaction to such disturbance.

4,603,779

GLASSWARE PACKAGE

George Meyers, and David C. Mueller, both of Ashland, Ohio, assignors to The Garber Company, Ashland, Ohio

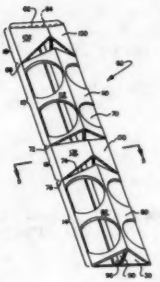
Continuation of Ser. No. 488,535, Apr. 25, 1983, abandoned. This application May 28, 1985, Ser. No. 738,508

Int. Cl.[4] B65D *85/44*

U.S. Cl. 206—426 **11 Claims**

1. A package for displaying glassware, said package comprising a top wall and a bottom wall, said top and bottom walls each having retaining means for retaining the glassware within the package, and a pair of beam means interposed between said top and bottom walls for resisting relative movement of said top wall toward said bottom wall, each of said beam means comprising an end wall panel interconnected with said top and bottom walls and a pair of support panels extending inwardly of said end wall panels and abutting said retaining means, each of said support panels having first and second opposite edges, and said support panels being interconnected with opposite sides of said end wall panel along first edges of said support panels and being secured to each other adjacent second edges thereof at a location spaced apart from said end wall panel, said beam means including means for securing said support panels to each other, said securing means comprising a pair of securing panels each attached to a respective support panel at the second edge thereof, and means for securing said support panels to said end wall panel at a location spaced inwardly along said end wall panel and for supporting said support panels in a position spaced inwardly from said end wall panel, said means for securing said support panels to said end wall panel comprising a panel attached to one of said securing panels.

7. A blank which is foldable into a package for displaying glassware, the package having top and bottom walls and a pair of end walls, said blank comprising a longitudinally extending sheet of foldable material having a series of first score lines extending transversely to the longitudinal extent of said sheet and defining a series of panels comprising a bottom wall panel, a first end wall panel, a top wall panel, a second end wall panel, and an attachment panel, said sheet further including a pair of

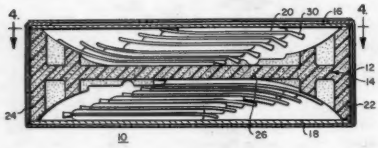


retaining panels foldably interconnected to opposite sides of each of said top and bottom wall panels along second score lines extending generally perpendicularly to said first score lines, each of said retaining panels including means defining openings for receiving and retaining the glassware, a plurality of support panels each foldably interconnected to each one of said end wall panels along one of a series of third score lines on opposite sides of each of said end wall panels, said support panels being foldable inwardly along said third score lines and being sized abut said retaining panels and to abut each other along sides of said support panels opposite from said end wall panels when said blank is folded into the package to form with said end wall panels a pair of beam means interposed between said top and bottom walls for resisting relative movement of said top wall toward said bottom wall, a plurality of securing panels each foldably interconnected with each of said support panels along a side of said support panels opposite from said end wall panels and sized to secure said support panels to said end wall panels at a location spaced inwardly along said end wall panels from said support panels and adapted to support said supoort panels in a position spaced inwardly from said end wall panels to form said beam means, when said blank is folded into the package, and a plurality of panels for securing said securing panels to respective end walls.

4,603,780
CARTON FOR HOUSING FRAGILE CONTAINERS

Joseph K. Duffy, Lake Forest; Mark L. Thoene, Ingleside, and Cathy M. Combs, Antioch, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 12, 1984, Ser. No. 680,854
Int. Cl.[4] B65D *81/02, 81/16*
U.S. Cl. 206—591 15 Claims

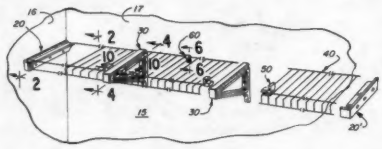


1. A carton for fragile frozen product containers comprising:
energy absorbing insert means for absorbing impact forces to the carton, the fragile frozen product containers being located on opposite sides of the energy absorbing insert means;
two rigid plates located on opposite sides of the energy absorbing insert means for compressing the frozen product containers against the energy absorbing insert means; and
packaging means for surrounding the energy absorbing insert means, the frozen product containers, and rigid plates, and forcing the rigid plates against the frozen product containers towards the energy absorbing insert means.

4,603,781
SHELF ASSEMBLY

Delvin R. Ryan, Jr., Lake Forest, Ill., assignor to SEVKO, Inc., Deerfield, Ill.

Filed Oct. 5, 1983, Ser. No. 539,262
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—90 2 Claims

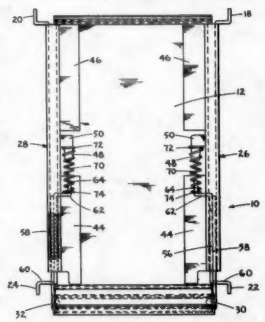


1. A shelf assembly attachable to an associated wall or walls, said assembly comprising:
a plurality of parallel spaced platform members and a plurality of spaced frame members fixedly connected to said platform members so as to define a generally rectangular grid-like shelf member, each of said frame members extending normal to said platform members, each said frame member having distal ends extending beyond the outermost platform members;
a pair of shelf end support brackets, each said bracket having means for freely supporting the distal ends of said frame members so as to support said shelf in a generally horizontal plane when said support brackets are secured to said wall or walls;
each of said end support brackets including an elongated base member having a first generally planar surface for juxtaposition with said wall, and a flange integrally formed therewith and extending generally outwardly therefrom, said flange being provided with a platform surface adapted to receive and support one said of said distal ends of said frame members of said shelf in a plane parallel to the plane of said platform surface on said flange and;
said shelf member further including a guide member parallel to said frame members and disposed in a different plane, said guide member also having distal ends extending beyond said platform members,
each said flange of said end support bracket being provided with a slot therein adapted to receive the adjacent distal end of one said guide member thereby to prevent relative motion between said shelf member and said end bracket when said shelf member is disposed thereon,
each said slot being disposed at the forward portion of one end bracket, said slot including a front wall extending above the platform surface of said flange, to conceal the distal ends of said guide member and said frame members, providing a finished appearance to said assembly.

4,603,782
ADJUSTABLE SHELF ASSEMBLY

Jay G. Fenwick, Albert Lea, Minn., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 12, 1985, Ser. No. 722,622
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—153 21 Claims

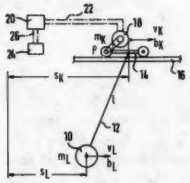


1. An adjustable shelf assembly useable with a rack frame having a plurality of spaced, slotted frame members, said adjustable shelf assembly comprising:
a generally planar rectangular shelf pan defined by a front edge, a rear edge, and spaced side edges;
fixed shelf support tabs spaced along said rear edge of said shelf pan, said fixed shelf support tabs being receivable in selected slots in first ones of the frame members;
slideable shelf support tabs spaced along said front edge of said shelf pan, said slideable shelf support tabs being receivable in selected slots in second ones of the frame members;
means to bias said slideable shelf support tabs toward said front edge of said shelf pan; and
actuating means for moving each of said slideable shelf support tabs away from said front edge of said shelf pan against said bias means, said actuating means including an actuating button positioned between a ticket snap on channel and a spaced, ticket support cover secured to said ticket snap on channel, said ticket snap on channel being secured to said front edge of said shelf pan whereby said slideable shelf support tabs are disengagable from the slots in said second ones of the frame members.

4,603,783
DEVICE ON HOISTING MACHINERY FOR AUTOMATIC CONTROL OF THE MOVEMENT OF THE LOAD CARRIER

Hans Tax, Munich, and Herbert Kürz, Putzbrunn, both of Fed. Rep. of Germany, assignors to BETAX Gesellschaft für Beratung und Entwicklung technischer Anlagen mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 756,557, Jul. 17, 1985, abandoned, which is a continuation of Ser. No. 477,223, Mar. 21, 1983, abandoned. This application Nov. 21, 1985, Ser. No. 800,895
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1982, 3210450
Int. Cl.[4] B66C *19/00*
U.S. Cl. 212—132 **13 Claims**



1. Device for hoisting machinery for atuomatically controlling the movement of a load carrier and for steadying the pendulum-type motion of a load suspended from said load carrier which motion occurs during acceleration or braking of the load carrier during the corresponding acceleration time interval or braking time interval, comprising a load carrier traction motor, a signal transmitter for sending control signals for controlling the movement of said load carrier traction motor, a signal progression for controlling the traction motor corresponds to a load carrier acceleration progression (b_K) symmetrical to the center (T/2) of the interval with maximum acceleration values ($b_K(0)$) at the beginning and end of the interval and smaller minimum acceleration values between the values at the beginning and end of the interval, the signal progression produced by said signal transmitter (**24**) corresponds to a load carrier accelearion (b_K) monotonically decreasing or increasing between said maximum acceleration values ($b_K(0)$), and when the following relationship applies to load carrier acceleration (b_K):

$$b_K = \frac{v_N}{n \cdot T_o}\left(1 + \left(\frac{1}{g} - \frac{T_o^2}{4\pi^2}\right)\frac{4\pi^2}{T_o^2} \cdot \cos\left(\frac{2\pi t}{T_o}\right)\right)$$

where V_N is the difference in velocity before and after acceleration or braking, l represents the pendulum length of the load, g is the acceleration due to gravity, and n represents a whole number, and T_o is the period (natural oscillation time of the pendulum) to which the following relationship applies:

$$T_o = \sqrt[3]{\frac{v_N}{n \cdot b_K(0)} \cdot \frac{1}{g} \cdot 4\pi^2}$$

4,603,784
NURSING BOTTLE SYSTEM

Wei C. Chang, 145 4th Ave., Mt. Vernon, N.Y. 10550

Filed Dec. 31, 1985, Ser. No. 815,451
Int. Cl.[4] A61J *9/00;* **B65D** *23/00*
U.S. Cl. 215—11 R **13 Claims**

1. A nursing bottle system, comprising:

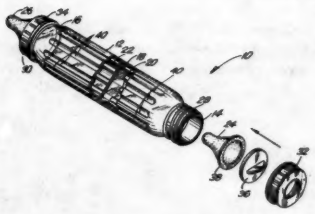
an integrally formed generally cylindrical container body of plastics material;

a dividing wall integrally formed with and extending perpendicular to the axis of said container body, for dividing the interior space of said body into first and second container portions which are liquid tightly sealed from one another;

a pair of nipples each adapted to be fitted in sealing relation to a corresponding open end of said container body; and

cap means associated with each of said nipples for securing said nipples to the correspondg open ends of said container body in a selected one of a first configuration in which the nipple faces inwardly into the corresponding open end of said container body and said body can be placed in a standing position on said cap means, and a second configuration in which the nipple faces outwardly from the corresponding open end of said container body for delivering a liquid food from the associated container portion to an infant;

wherein two different liquid foods can be carried by said container body each in a corresponding one of said first



and said second container portions, to be fed selectively to the infant when the cap means associated with the container portion in which the selected liquid food is carried is placed in the second configuration.

4. A nursing bottle system, comprising:

first and second generally cylindrical container bodies of plastics material, each having an open top end and a closed bottom wall;

a pair of nipples each adapted to be fitted in sealing relation to the open end of a corresponding one of said container bodies;

cap means associated with each of said nipples for securing said nipples to the open ends of said container bodies; and

fastening means for detachably joining said first and said second container bodies axially to one another with their closed bottom walls in confronting relation, so that two different liquid foods can be carried by said first and said second container bodies when joined to one another, and said liquid foods can be fed selectively to an infant when said container bodies are either joined or detached from one another.

4,603,785
TAMPER INDICATING CLOSURE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corp., Evansville, Ind.

Filed Nov. 19, 1984, Ser. No. 673,013
Int. Cl.[3] B65D *55/02*
U.S. Cl. 215—230 **9 Claims**

1. A tamper indicating closure for a container having a threaded neck forming an opening comprising, in combination: a cup shaped cap.member made from clear plastic material having internal threads to engage with threads on the neck of said container; a disc member having a friction generating means for engagement with said neck; cooperating drive means including a drive post on said cap member engagable with a lug on said disc member, indicia applied to the first one of the inside of the top of said cap member or the top of said

disc member in a manner to be clearly visible through said cap member, and radially extending wiper means on the other of the inside of the top of said cap member or the top of said disc member in contact with the first one of the inside of the top of said cap member or the top of said disc member, whereby upon initial rotational movement of said closure in a closing direction, said cap and said insert members move as a unit, the

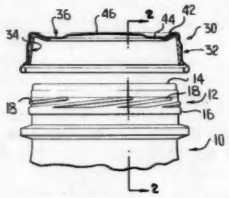
cooperating drive post and lug being in engagement, and said friction generating means engages the neck of said container, said indicia remaining undisturbed, and upon rotational movement of said closure member in an opening direction said cap member will move relative to said disc member, and said wiper moves across said indicia and said indicia is distorted or partially removed by said wiper passing over thereover, indicating an initial opening of the closure has been made.

4,603,786

PRESS-ON CLOSURE FOR RESEALABLE GLASS FINISH

Frank H. Lecinski, Jr., Harwood Heights, and William J. Thomas, Bolingbrook, both of Ill., assignors to Continental White Cap, Inc., Northbrook, Ill.

Filed Apr. 2, 1985, Ser. No. 719,160
Int. Cl.[4] B65D *53/00*
U.S. Cl. 215—318 **18 Claims**



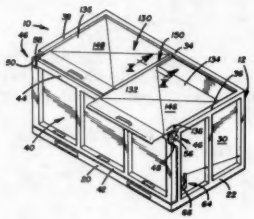
1. A resealable press-on closure for containers of the type having a neck finish including threads, said closure comprising a shell including an end panel and a depending skirt, and a plastisol compound liner extending a major portion of said skirt and at least partially across said end panel, said liner including an end seal portion and a thread forming portion, said closure being improved by said plastisol compound being a closed cell foam structure having a related percent puff range and hardness ratio wherein when said closure is applied a thread impression will be formed in the said compound thread forming portion wherein a resultant opening torque will be equal to or less than a reapplication strip torque, said percent puff ranging between 50 and 80%, and said hardness having a Shore "A" hardness range of between 50 and 70.

4,603,787

MULTI-USE JOB BOX

Larry Essary, 1663 Corte De Pons, San Jose, Calif. 95124,

Filed Oct. 1, 1985, Ser. No. 782,521
Int. Cl.[4] B65D *88/00*
U.S. Cl. 220—1.5 **8 Claims**



1. A multi-use job box, comprising:

an open top open front box-like structure having a generally rectangular base having a front edge, a pair of lateral edges and a back edge, a generally rectangular back wall and a pair of generally rectangular side walls, the back wall and the side walls proceeding upwardly generally perpendicularly from respective edges of the base to respective upper portions a substantially equally spaced distance above the base;

a front panel of generally the same size and shape as the back wall, the front panel having a lower edge and a upper edge;

mounting means for pivotally mounting the front panel adjacent the upper edge to the upper portions of each of the sidewalls with the front panel pivotable to close the open front of the box-like structure;

holding means for releasably holding the lower edge of the front panel adjacent to the front edge of the base;

remote releasing means for operator remote releasing of the holding means; and

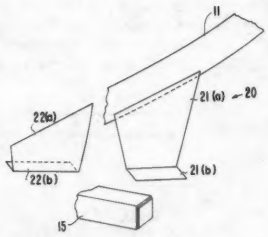
fastening means for fastening the box-like structure to a lifting device.

4,603,788

FREIGHT CONTAINER FOR FLOWABLE MATERIALS

Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwalder Eisenwerk Gerhard GmbH, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 643,856
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330561
Int. Cl.[4] B65D *88/06, 88/12, 90/00*
U.S. Cl. 220—1.5 **20 Claims**



16. A freight container for flowable materials comprising:

a tank having reinforcing rings extending circumferentially around the tank,

a pair of end frames supporting said tank, the corners of each end frame being provided with corner fittings, and

diagonal members having their outer ends connected to respective corner fittings of said end frames and their inner ends joined to respective ones of said reinforcing rings via transition pieces,

each transition piece being composed of two brackets having first surfaces seated on the respective diagonal member and second surfaces extending to the two opposite sides of the respective reinforcing ring, said first and second surfaces being angularly inclined with respect to one another;

wherein the second surfaces of said brackets increase in width from said diagonal members towards the respective reinforcing rings.

4,603,789

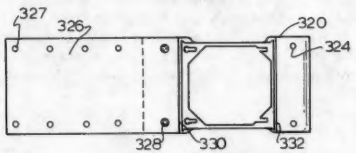
EXTENSION BRACKET FOR MOUNTING ELECTRICAL OUTLET BOX

Lewis B. Medlin, Sr., P.O. Box 127, Blue Ridge, Va. 24064

Continuation-in-part of Ser. No. 750,264, Jul. 1, 1985, Pat. No. 4,572,391. This application Dec. 24, 1985, Ser. No. 813,258

Int. Cl.[4] H02G *3/08*

U.S. Cl. 220—3.9 **16 Claims**



1. A single electrical outlet box stud offset mounting assembly, comprising:

(a) a square outlet box having integrally joined base and sidewalls formed with a selected number and size of knock-out discs and on the outer edge of each sidewall of one opposed pair of said sidewalls having at least one inwardly-directed, laterally-spaced screw receiving tab with a threaded hole and positioned to provide at least one pair of diagonally opposite said tabs overlying an interior chamber formed by said box;

(b) a dry wall ring having a central opening and a peripheral plate flange with screw clearance openings arranged for being mated to said tab threaded holes;

(c) a mounting bracket comprising an L-shaped unitary mounting bracket formed of a single piece of stiff sheet material, including:

(i) first and second contiguous rectangular plate portions in right angular relation at a first end of said bracket, said first plate portion being sufficiently wide to substantially equal the width of the interior space of the wall on which said bracket is installed to thereby serve as a stiffening member for said bracket; and

(ii) a plate body portion extending outwardly from said second plate portion having:

(aa) at an outer end a third rectangular flat plate end portion in the same plane as the plane of said second plate portion, said third plate end portion being adapted for securement to one end surface of an extension plate and having a pair of holes formed therein for receiving a mating pair of fasteners to effect said securement;

(bb) between said third plate portion and second plate portion having a fourth rectangular plate portion in a plane offset from and substantially parallel to the plane of said second and third plate portions by an amount substantially equal to the thickness of a said dry wall ring flange, said fourth plate portion plane being established by parallel offsets formed on both sides of said fourth plate portion;

(cc) an opening in said fourth plate portion substantially defined by opposed straight parallel upper and lower and opposed straight parallel right and left side edges and corner edges formed in said fourth plate portion around said opening, said opening being sized to register with the interior chamber of said box with the width of said opening being substantially equal to the spacing between a tab on one of said sidewalls and the opposite tab on another of said sidewalls;

(dd) a first pair of laterally spaced screw slots matable with at least one of said tabs located adjacent a selected edge of said fourth plate portion opening;

(ee) a second pair of laterally spaced screw slots matable with at least one other of said tabs extending from a second selected edge of said fourth plate portion opening opposite said first selected edge of said fourth plate portion opening, said second slots having a depth sufficient for at least limited box mounting adjustment on said bracket in the direction in which said slots are oriented and being positioned opposite to said first pair of slots; and

(ff) a flange ring turning surface established by the spacing of said right and left edges of said opening from the said respective offsets on either side thereof and formed such that when a selected screw clearance opening on said dry wall ring rotates around a screw installed in a selected one of said tab threaded holes as another diagonally opposite selected said screw clearance opening is positioned to engage another diagonally opposite screw in another diagonally opposite said tab threaded hole, the bottom surface of said dry wall ring is able to slide on said fourth plate portion;

(d) a plurality of screws adapted for being loosely fitted in said slots and for being secured in said tab threaded holes; and

(e) a rectangular extension plate formed of a single piece of flat stiff sheet material with a stiffening arm at one end in right angular relation and sufficiently wide to substantially equal the width of the interior space of the wall on which said bracket is installed and having a plurality of sets of pairs of holes spaced lengthwise thereof located and adapted for receiving fasteners to secure an opposite end of said plate to the front surface of a stud utilizing one selected pair of said holes to establish the distance by which said bracket is offset from said stud and to secure said one end to said bracket third plate portion utilizing another selected pair of said holes in said plate mating a pair of holes in said bracket third plate portion,

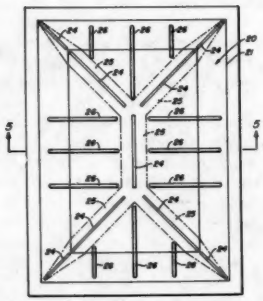
whereby when a said bracket has the third plate portion thereof secured to said one end of said extension plate and the opposite end of the extension plate is in turn secured to the front surface of a construction stud and fasteners are installed to perfect the securement and an electric outlet box is positioned adjacent the inner side of said fourth plate portion of said bracket in position with respect thereto so that the interior of said respective electric outlet box is accessible through the respective said fourth plate portion opening adjacent thereto and a dry wall ring is fixed to the other side of said fourth plate portion, said first plate portion tend to stiffen said bracket, said stiffening arm tends to stiffen said plate and said slots enable said outlet box, bracket and dry wall ring to be held in operative position with screws passed through said slots and secured in said tab-threaded holes with said tabs being oriented to mate with selected edges surrounding the respective said opening adjacent said box and whereby the outer surface of the flange of said ring is maintained when said screws are tightened in substantially the same plane as the outer surface of said second and third plate portions of said bracket on which said ring is mounted.

4,603,790

TENSIONED RESERVOIR COVER, RAINWATER RUN-OFF ENHANCEMENT SYSTEM

Dennis H. Gerber, Los Gatos, Calif., assignor to Burke Industries, Inc., San Jose, Calif.

Filed Mar. 11, 1985, Ser. No. 710,167
Int. Cl.[4] B65D *88/38*
U.S. Cl. 220—219 2 Claims



1. A rainwater run-off enhancement system for tensioned reservoir covers comprising:

a. a flexible cover member of substantially fluid impervious material of sufficient area to cover said reservoir;

b. means connecting the perimeter of said cover member to the perimeter of said reservoir;

c. sump weighting means positioned with respect to said cover member at the pre-selected positions;

d. a plurality of cover sump portions formed in said cover by said weighting means, each of said sump portions being defined, narrow, elongated and interconnected and having generally vertical sidewalls in tension and having a selected location for all working fill levels of said reservoir;

e. a plurality of generally horizontal cover portions formed in said cover by said weighting means, each of said horizontal cover portions having a selected geometric shape and positioned at a selected location for all working fill levels of said reservoir and all of said horizontal cover portions are in tension in at least two different horizontal directions of sufficient magnitude to permit workmen to traverse all portions of said horizontal cover portions for all working fill levels with said horizontal cover remaining substantially planar in sustaining the weight of the workmen;

f. said horizontal cover portions are bordered by said reservoir perimeter and said sump portions and cover substantially all of the surface of said reservoir for all working fluid level conditions;

g. a plurality of rain enhancement elongated weight means having a lineal per foot weight substantially less than the per lineal foot weight of said sump weighting means;

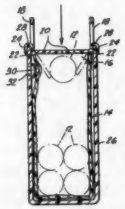
h. said rain enhancement weight means are positioned with respect to said tensioned horizontal cover portions so as to form elongated depressions terminating adjacent said cover sump portions for directing surface water into said sump portions.

4,603,791

REFUND BOTTLE AND CAN BAG

Stuart Spierer, and George Spector, both of 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Jan. 31, 1985, Ser. No. 697,053
Int. Cl.[4] B65D *25/16, 37/00;* G06M *7/04*
U.S. Cl. 220—404 6 Claims



1. A disposable bag adapted to be removably mounted in a container having a rim, comprising:

(a) a body of thin flexible sheet material having an opening at top end to form a mouth, said body being wide and long enough to accomodate refund bottles of a two liter size;

(b) a pair of handles extending upwardly from opposite sides of said mouth of said body so that said body can be carried;

(c) a pair of trap doors, each said trap door hingeably affixed to said mouth of said body below one of said handles and extending inwardly half way across said mouth;

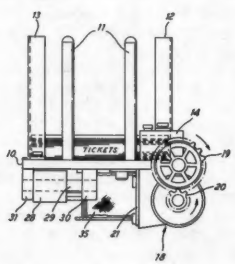
(d) a pair of hook members, each said hook member affixed to said hinge of one of said trap doors and extending outwardly away from said mouth of said body.

4,603,792

TICKET ISSUING MACHINE WITH PRODUCT DISPENSER

Royston D. Molineux, 6 The Firs, Bexley, Kent, England

Filed Jul. 12, 1984, Ser. No. 630,230
Claims priority, application United Kingdom, Jul. 21, 1983, 8319683
Int. Cl.[4] G01F *11/16*
U.S. Cl. 221—96 7 Claims



1. A ticket dispensing machine for application to a product dispensing apparatus, said machine comprising

(a) support means for a stack of tickets,

(b) a ticket drive roller,

(c) an electric motor drivably coupled to said roller,

(d) striker means adapted to engage an edge of the end ticket of the stack,

(e) means for driving said striker means in a direction to convey said ticket towards said roller,

(f) a sensor capable of initiating a signal on detecting the presence of a product being dispensed,

(g) electric circuit means connected to said sensor to activate said electric motor thereby to dispense said ticket from the machine on receipt by said circuit means of an input signal initiated by said sensor,

(h) timing means to actuate the motor and the striker drive means after a predetermined period from commencement of sensing of the presence of the product, said timing means being adapted to actuate the motor and the striker drive means only when the predetermined period exceeds a preselected value, and

(i) means for automatically repositioning said striker means to be available for dispensing the next ticket when required.

4,603,793

COUPLING DEVICE FOR CONNECTING A MATERIAL OUTLET TO A PACKING

Leif E. Stern, Fattershus, Lund, Sweden (225 90)

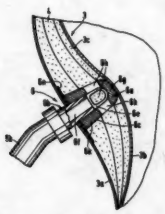
PCT No. PCT/SE81/00002, § 371 Date Dec. 10, 1981, § 102(e) Date Dec. 10, 1981, PCT Pub. No. WO81/01992, PCT Pub. Date Jul. 23, 1981

Continuation of Ser. No. 333,860, Dec. 10, 1981, abandoned. This PCT application Jan. 9, 1981, Ser. No. 738,907

Claims priority, application Sweden, Jan. 10, 1980, 8000199

Int. Cl.[4] B65D *35/56*

U.S. Cl. 222—105 **1 Claim**



1. A coupling device for connecting a material discharge to a pliable packing, comprising:

packing coupling means positioned entirely within opposing walls of the packing; and

material discharge coupling means engagable with said packing coupling means when said packing is suspended;

wherein said packing coupling means includes a first ring of elastic material attached along an inner surface of a first opposing wall of the packing, said first ring provided with a gripping portion for retainable engagement of the material discharge coupling means, and a second ring spaced from the plane of the first ring and extending into the interior of the packing, said second ring connected to said first ring by means of a plurality of spaced legs;

wherein the legs extend obliquely from the first ring to the second ring, the packing coupling being thereby divergent from the first to the second ring;

wherein the first ring of elastic material is attached along an annular surface thereof to an unbroken portion of the first opposing wall;

wherein the second ring of the packing coupling has a planar surface facing the inner surface of the packing wall opposite the wall to which the first ring is attached;

wherein the first and second rings of the packing coupling are planar and extend parallel to each other;

wherein the material discharge coupling means includes a grip portion having peripheral teeth and a conically tapered shape for engagement with the gripping portion of the packing coupling means;

wherein engagement of the material discharge coupling means breaks the surface of the first opposing wall; and

wherein the legs of the packing coupling are connected to the inner edge of the second ring, said second ring having a substantially larger outer diameter than the first ring.

4,603,794

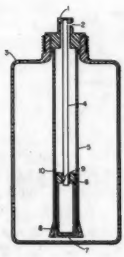
PRESSURE MULTIPLYING DISPENSER

Henry S. DeFord, and Owen R. Moss, both of Kennewick, Wash., assignors to Battelle Development Corporation, Columbus, Ohio

Filed Mar. 29, 1985, Ser. No. 717,412

Int. Cl.[4] B65D *37/00*

U.S. Cl. 222—207 **12 Claims**



1. A dispensing apparatus for delivering fluid from a source of fluid when subjected to a positive pressure comprising:

(a) an actuator cylinder having inlet means for inletting fluid communicating with the source of fluid and an outlet end connectable to orfice means for delivering the fluid to the atmosphere,

(b) an actuator piston slideable onto a fixed position delivery tube and the actuator piston being slideable within the actuator cylinder from a first position near the inlet means to a second position toward the outlet end, the piston being hollow and having at least one fluid inlet orifice communicating with the actuator cylinder inlet means when the actuator piston is in the first position but not when the actuator piston is in the second position, and

(c) the fixed position delivery tube having an exit end for delivering the fluid from the actuator piston to the orifice means connected to the outlet end of the actuator cylinder and having an entrance means communicating with the actuator piston for delivering fluid from the actuator piston to the delivery tube such that the interior of the delivery tube is in communication with the fluid in the actuator piston when the actuator piston is in its second position but not when the actuator piston is in its first position.

4,603,795

CENTER UNLOADING BIN FOR STORING FREE-FLOWING GRANULAR MATERIAL WITH SIDE CONVEYOR DISCHARGE

Timothy C. Bonerb, P.O. Box 200, North Conway, N.H. 03860, and Vincent C. Bonerb, P.O. Box 2016, Buffalo, N.Y. 14219

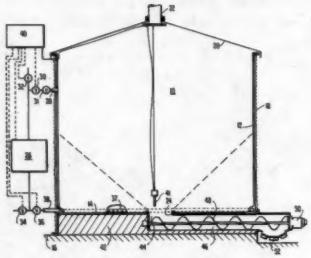
Continuation-in-part of Ser. No. 257,604, Apr. 27, 1981, Pat. No. 4,421,250, which is a continuation-in-part of Ser. No. 307,089, Sep. 30, 1981, Pat. No. 4,449,646. This application Mar. 12, 1982, Ser. No. 357,589

Int. Cl.[4] B65D *88/62*

U.S. Cl. 222—262 **6 Claims**

1. A bin for storing and discharging free-flowing granular material on a bottom capable of supporting the weight of the stored free-flowing granular material, the bin including a flexible inflatable fluid impervious double-walled cup-shaped bag having a bottom with a central discharge opening and side walls, the top of the side walls of the cup-shaped bag being always above the maximum height of material in the bin after it has discharged by gravity through a central discharge open-

ing to assume its angle of repose, a rigid outer bin wall, means to inflate a space between the double walls of the bag, with the improvements comprising; means defining a hollow space discharge well in the bottom center of the bin above the level of the support floor, the central discharge opening in the bot-



tom of the cup-shaped bag attached to the means defining a hollow space discharge well in the bottom of the bin, a conveyor extending from the hollow space discharge well bottom center of the bin to outside and through the bin side wall means and above the level of the support floor.

4,603,796

CLOSING AND FILLING UNIT FOR A TANK CONTAINING A FLUID UNDER PRESSURE

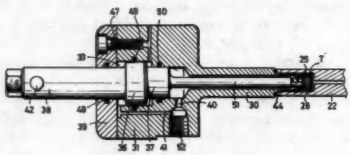
Jean-Louis Joly, Bazemont, and Bernard Lallemant, Verneuil, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, France

Filed May 9, 1985, Ser. No. 732,426

Claims priority, application France, May 18, 1984, 84 07764

Int. Cl.[4] B65D *83/00*; F16K *31/00*

U.S. Cl. 222—400.7 **9 Claims**



1. A closing and filling unit for a tank containing a fluid under pressure, said unit comprising in combination: a piston valve having a body and a closure piston in said body and provided with axial openings, and a device for actuating said valve comprising a rotatable and slidable element and means for utilizing the pressure of said fluid when filling and emptying the tank so as to urge said element into engagement with the closure piston, said device being detachably fixed to the body of the valve.

4,603,797

BOW WINDER

Joseph S. Gallo, Sr., 58 Peach St., Walpole, Mass. 02081

Filed Dec. 23, 1985, Ser. No. 812,276

Int. Cl.[4] A41H *43/00*

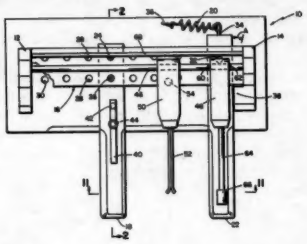
U.S. Cl. 223—46 **19 Claims**

1. Apparatus for winding bows from ribbon , comprising a base,

first and second arms about which said ribbon may be wound in a plurality of loops, said arms being supported on said base,

a rotatable joint for supporting said second arm on said base so that it is capable of rotation toward said first arm,

spring means for resisting rotation of said second arm toward said first arm,



said rotatable joint and spring means being capable of permitting said second arm to rotate toward said first arm sufficiently to allow said loops of ribbon to be drawn together midway between said arm in forming a bow

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4,603,798

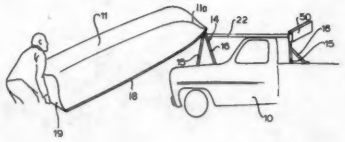
CAR TOP CARRIER

Wayne D. Griswold, 914 Screenland Dr., Burbank, Calif. 91505

Filed Sep. 2, 1983, Ser. No. 529,047

Int. Cl.[4] B60P *3/10*

U.S. Cl. 224—310 **6 Claims**



1. A vehicle top boat carrier comprising:

a first support assembly adapted to be secured to the front of a vehicle including a single point support member having a pivotal securing means at a level corresponding approximately with the top of the vehicle;

a pair of support members securable to the vehicle at a distance rear of the first support, extending upward to at least the level of the top of the vehicle and laterally spaced to engage and support the gunwales of a boat;

whereby a pointed prow boat may be carried on said vehicle with the bow region secured to said front support at the pivotal attachment, and the gunwale portions providing three point support for the boat;

wherein said pivotal securing means includes pivot means installable in an upward direction to provide pivoting of the boat thereabout during loading and unloading thereof and said securing means is reversible with the boat in place to provide a positive lock for the bow of the boat.

4,603,799

FORWARD FEED ASSEMBLY FOR CONTINUOUS FORWARD FEED OF OPEN TUBULAR FABRIC UNDER CONTROLLED TENSION

Jean E. Schaerer, Apartment 243, 800 Clark Blvd., Bramalea, Ontario, Canada L6T, 2E8

Filed Dec. 21, 1984, Ser. No. 685,020

Claims priority, application Switzerland, Dec. 30, 1983, 6983/83

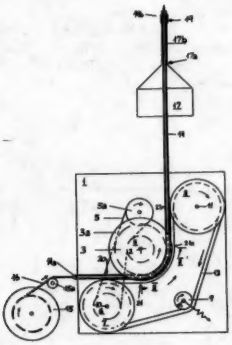
Int. Cl.[4] B65H *20/02, 20/06*

U.S. Cl. 226—171 **2 Claims**

1. A forward feed assembly for continuous forward feed of open tubular fabric to a subsequent processing station comprising:

an elongated curved guide mandrel over which the open tubular fabric passes,

pulley means on one side of the curved guide mandrel operable to drivingly engage the fabric, said guide mandrel curving through at least about 90° around a portion of the circumference of the pulley means, and



endless belt drive means on an opposite side of the curved guide mandrel to drivingly engage the fabric at the same fabric engaging speed as the pulley means as the fabric passes over the curved guide mandrel around the pulley means and to retain the curved guide mandrel in position around the pulley means.

4,603,800

APPARATUS FOR TRANSPORTING SHEETS OF PACKAGING MATERIAL

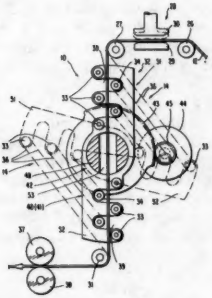
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,871

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410470

Int. Cl.⁴ B65H *20/34*

U.S. Cl. 226—119 **6 Claims**



1. Apparatus for transporting sheets of material, said apparatus including means for temporarily storing at least one of said sheets of material (12), said temporary storing means comprising:

a supply rocker (10) which includes a looping roller carrier (32), a plurality of looping rollers (33) mounted on said looping roller carrier, a plurality of fixed counter rollers (34) positioned relative to said looping rollers such that said sheet of material can pass between said looping rollers and said counter rollers, and a pivot bearing (42) which includes a rotatable axle (48); and

means for pivoting said looping roller carrier (32) about said pivot bearing (42) to thereby cause said looping rollers to move relative to said counter rollers to permit said sheet of material to either run in a straight line between said looping rollers situated on one side thereof and said counter rollers situated on the other side thereof or run in a looped path between said looping rollers and said counter rollers, depending on the position of said looping roller carrier;

wherein said looping roller carrier is comprised of first and second pivot arm portions (51,52) extending in opposite directions from said pivot bearing (42), each of said pivot arm portions having mounted thereon a plurality of looping rollers, associated fixed counter rollers being provided for the looping rollers of each of said first and second pivot arm portions; and

wherein said rotatable axis (48) is connected to said looping roller carrier (32) to rotate therewith, and includes a slit-shaped passage (53) through which said sheet of material may pass regardless of the position of said looping roller carrier.

4,603,801

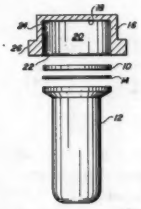
DIFFUSION BONDING OF MECHANICALLY HELD COMPONENTS BY HOT ISOSTATIC PRESSURE

Chung-Chu Wan, Northridge, and Glenn W. Brown, Rancho Palos Verdes, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 24, 1984, Ser. No. 633,817

Int. Cl.⁴ B23K *20/02, 20/16*

U.S. Cl. 228—194 **5 Claims**



1. In a hot isostatic pressing operation utilizing a pressure transmitting medium, the method of isolating a cladding-substrate seam comprising the steps of:

preforming a cladding to a substrate to form a workpiece;

interference fitting a seam isolator about the cladding-substrate seam;

submerging the workpiece into the pressure transmitting medium contained within a deformable container; and

subjecting said container and workpiece to hot isostatic pressing conditions.

4,603,802

VARIATION AND CONTROL OF BOND FORCE

John A. Kurtz; Donald E. Cousens, both of Saco, and Mark D. Dufour, Portland, all of Me., assignors to Fairchild Camera & Instrument Corporation, Cupertino, Calif.

Filed Feb. 27, 1984, Ser. No. 584,084

Int. Cl.⁴ B23K *1/06, 20/10*

U.S. Cl. 228—1.1 **18 Claims**

1. An improved lead wire ball bonding machine having a movable bonding head comprising an elongate tool holder and a capillary bonding tool secured in the tool holder for ball bonding the end of a lead wire held in the bonding tool to a die pad of an integrated circuit chip and for wedge bonding a segment of the lead wire spaced from the ball bond to a lead

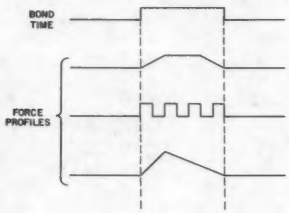
frame finger during successive ball bond wedge bond cycles, bond force means for applying first bond force at the bonding tool during ball bonding and for applying second bond force at the bonding tool during wedge bonding, bonding machine logic control means generating control signals for initiating and timing steps in the ball bond wedge bond cycle, wherein the improvement comprises:

said bond force means comprising solenoid means coupled to the bonding head for applying said first and second bond forces to the bonding tool for ball bonding and wedge bonding respectively during successive ball bond wedge bond cycles;

solenoid control circuit means coupled to said solenoid means and constructed and arranged to actuate said solenoid by delivering a first current having a first current amplitude profile for applying said first bond force with a first force profile during ball bonding to die pads and by delivering a second current having a second current amplitude profile for applying said second bond force with a second force profile during wedge bonding to lead frame fingers;

and processor means coupled to the solenoid control circuit means to provide programmed variation in the first current amplitude profile and first force profile of the first bond force for different die pads of an integrated circuit chip and for providing variation in the second current amplitude profile and second bond force for different lead frame fingers.

11. An improved lead wire ball bonding machine having a movable bonding head comprising an elongate tool holder and



a capillary bonding tool secured in the tool holder for ball bonding the end of a lead wire held in the bonding tool to a die pad of an integrated circuit chip and for wedge bonding a segment of the lead wire spaced from the ball bond to a lead frame finger during successive ball bond wedge bond cycles, bond force means for applying first bond force at the bonding tool during ball bonding and for applying second bond force at the bonding tool during wedge bonding, bonding machine logic control means generating control signals for initiating and timing steps in the ball bond wedge bond cycle, wherein the improvement comprises:

said bond force means comprising variable linear drive means coupled to the bonding head for applying said first and second bond forces to the bonding tool for ball bonding and wedge bonding respectively during successive ball bond wedge bond cycles;

control circuit means coupled to said variable linear drive means and constructed and arranged to actuate said variable linear drive means by delivering a first current having a first current amplitude profile for applying said first bond force with a first force profile during ball bonding to die pads and by delivering a second current having a second current amplitude profile for applying said second bond force with a second force profile during wedge bonding to lead frame fingers;

and processor means coupled to the control circuit means to provide variation in the first current amplitude profile and first force profile of the first bond force for different die pads of an integrated circuit chip and for providing variation in the second current amplitude profile and second force profile of the second bond force for different lead frame fingers.

4,603,803

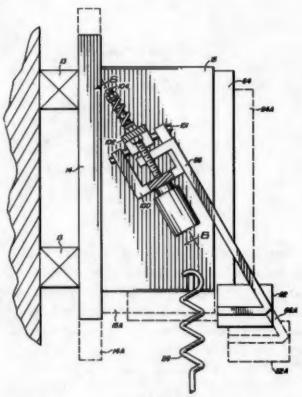
WIRE BONDING APPARATUS

Lo Kwan Chan, and Wai Sau Li, both of Hong Kong, Hong Kong, assignors to ASM Assembly Automation, Ltd., Kowloon, Hong Kong

Continuation of Ser. No. 410,945, Aug. 24, 1982, abandoned. This application Apr. 2, 1985, Ser. No. 718,936

Int. Cl.⁴ B23K *37/02*

U.S. Cl. 228—4.5 **4 Claims**



1. A wire-feed and wire-tear mechanism for a wire-bonding apparatus, comprising:

transducer means for providing a bonding force on an end surface of a bonding probe including a transducer horn provided with an orthogonally mounted bonding probe;

bond force solenoid means operably coupled to said transducer means for pivoting said transducer means and controlling the pressure applied to said end surface of said bonding probe;

wire source means operably coupled to said transducer means for supplying wire to said end surface along a diagonal axis at an acute angle from a vertical axis;

diagonally movable clamp means having a releasable clamp provided with a translation axis parallel to said diagonal axis of said wire being supplied to said end surface for movement in a reciprocal direction with said wire and for feeding and tearing said wire; and

solenoid actuated separate feed and separate tear drive means operably coupled to said clamp means for causing said clamp means to move forward and backward with respect to said end surface of said bonding probe parallel to said diagonal axis of said wire for feeding said wire and tearing said wire during a bonding procedure.

4,603,804

AUTOMATIC SOLDERING APPARATUS

Kota Takeda, Tokyo, and Tsugunori Masuda, Saitama, both of Japan, assignors to Kabushiki Kaisha Tamura Seisakusho, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,778

Claims priority, application Japan, Apr. 30, 1983, 58-77169

Int. Cl.⁴ B23K *1/08*

U.S. Cl. 228—40 **6 Claims**

1. Automatic apparatus whereby solder is applied to leads that project downwardly from the bodies of workpieces such as integrated circuit devices, each said body having a front

end, a rear end and a pair of opposite side surfaces, said apparatus being cooperable with a magazine wherein a plurality of said workpieces are lengthwise slidably confined in a row with a rear end of each workpiece adjacent to a front end of another, said apparatus being characterized by:

A. track means comprising a plurality of fixed substantially parallel rods cooperating to define a path along which workpieces are confined to motion lengthwise of the rods, said rods being so arranged that

(1) at least one of said rods is at a lowermost level for slidable support of workpieces thereon, and

(2) at least two of said rods are at a higher level and are laterally spaced apart by a distance to slidably engage opposite side surfaces of workpieces between them that are supported on said at least one rod, and

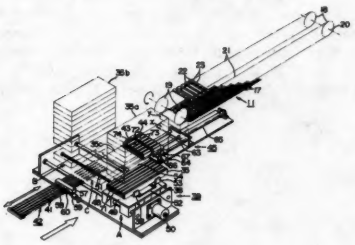
(3) said rods are so spaced apart that said leads on the workpieces can project downward between them;

B. workpiece propelling means comprising

(1) an endless carrier,

(2) rotary carrier supporting and drive means around which said endless carrier is trained for motion in an orbit that has a stretch portion which is above and substantially parallel to said rods and wherein said carrier moves in a forward direction, and

(3) a plurality of transportation pins carried by said endless carrier for orbital movement therewith, said pins being



spaced apart at intervals along said carrier and each being disposed to project down between rods of said track means when moving in said stretch portion, for engagement against the rear end of a workpiece to push the same forwardly along the track means;

C. a fluxing unit downwardly adjacent to said track means for fluxing leads of workpieces moved therepast along said track means;

D. a soldering unit downwardly adjacent to said track means, spaced in said forward direction from said fluxing unit, for applying solder to leads of workpieces moved therepast along said track means;

E. magazine holder means for readily removably fixing a magazine loaded with workpieces in a position to the rear of said track means;

F. pusher means for pushing workpieces in a row in said magazine forwardly toward said track means through successive distance increments, each of which is substantially equal to the length of a workpiece; and

G. workpiece separating means located between said magazine holder means and said track means, adapted to receive workpieces pushed out of a magazine by said pusher means and to carry them one by one to a position in which each is aligned with said track means and is in the orbit of a transportation pin that will push it along the track means.

4,603,805

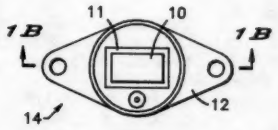
METHOD FOR ENHANCING THE SOLDERABILITY OF NICKEL LAYERS

William O. Rogers, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 20, 1985, Ser. No. 736,156

Int. Cl.[4] B23K *1/20*

U.S. Cl. 228—123 **10 Claims**



1. A process for improving the solderability of objects coated with a nickel and phosphorus mixture, comprising:

providing an object having thereon a nickel coating which contains phosphorus;

heating said coated object in an oxidizing atmosphere to a temperature of at least 347° C. for a time exceeding two minutes; and

thereafter heating said coated object in a reducing atmosphere to a temperature of at least 300 degrees C.

4,603,806

METHOD OF MANUFACTURING METAL PIPE WITH LONGITUDINALLY DIFFERENTIATED WALL THICKNESS

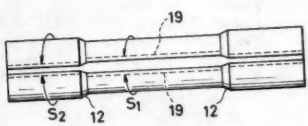
Kazuo Watanabe; Hiromi Seki; Kenji Yamada, all of Kitakyushu, and Yoshito Tsuyama, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,615

Claims priority, application Japan, Aug. 11, 1983, 58-145637; Aug. 11, 1983, 58-145638; Aug. 11, 1983, 58-145639; Jan. 18, 1984, 59-5516; Jan. 18, 1984, 59-5517

Int. Cl.[4] B23K *28/02*

U.S. Cl. 228—152 **8 Claims**



1. A method of manufacturing a metal pipe with longitudinally differentiated wall thickness comprising:

preparing a rectangular metal plate having opposite longitudinal edges which abut a thicker portion of said plate, a thinner portion of said plate and a transition portion of said plate between said thicker and thinner portions, said transition portion having a thickness intermediate the thickness of said thicker portion and the thickness of said thinner portion, the thickness of said plate in said thicker portion being greater than the thickness of said plate in said thinner portion;

reducing the width of said plate along each edge of said thinner portion of said plate with respect to the width of said thicker portion of said plate prior to bending said plate into a tubular shape with said edges abutting each other;

removing a portion of said plate along each edge of said plate on either side of said transition portion such that the width of said plate beyond said transition portion towards said thinner portion of said plate is greater than the width of said thinner portion of said plate and the width of said plate beyond said transition portion towards said thicker

portion of said plate is less than the width of said thicker portion of said plate, the width of said plate in said transition portion being intermediate the width of said plate on either side of said transition portion;

forming said metal plate which has a reduced width along each edge of said thinner portion into a tubular shape with said edges abutting each other; and

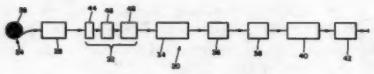
welding together the abutted edges of said plate to form a metal pipe.

4,603,807

MILL FOR ROLL FORMING A FLUTED TUBE

Theodore H. Krengel, Flossmoor, Ill., assignor to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Jun. 1, 1984, Ser. No. 616,281
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—152 **6 Claims**



1. A tubing mill for roll forming a strip of metal into a fluted tube having alternating, longitudinally extending, substantially continuous high and low portions on its outside surface, said mill comprising:

feed means for supplying a generally planar strip of metal;

embossing means for forming said high and low portions on both the surface of said strip to be formed into the outside surface of said tube and the surface of the strip to be formed into the inside surface of said tube;

breakdown means for sequentially transversely bending said strip from its generally planar condition, said breakdown means comprising roller means having a gripping surface for engaging one of said surfaces of said strip and having alternating high and low portions shaped to mate with those of said strip so that the high and low portions of said gripping surface make substantially full surface contact with their corresponding high and low portions on said one surface of said strip;

closure means for bringing together the lateral sides of the bent portion of said strip;

welding means for welding said lateral sides together; and

coating means for applying a coating to the outside surface of the welded tube, said mill further comprising downstream of said coating means a means for applying tension to said tube whereby said breakdown means and said means for applying tension cooperate to prevent substantial sagging of the tube therebetween.

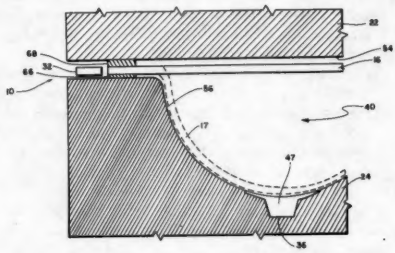
4,603,808

SUPER PLASTIC FORMING METHOD WITH HEAT TREATED SEALS

George W. Stacher, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 16, 1984, Ser. No. 631,376
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—265 **2 Claims**

1. A method of making metallic sheet structure by superplastic forming, which comprises: providing one or more metallic sheets, where at least one of said sheets possesses superplastic properties; providing first and second forming members which sandwich said one or more sheets, said first forming member having a cavity therein which defines a surface similar to the shape of said sheet structure desired to be formed; positioning one seal between said one or more sheets and said first forming member, and positioning a second seal between said one or more sheets and said second forming member, said seals being made of a seal material that is free of substances that will volatilize at superplastic forming conditions for said at least one sheet, said seal material being nonmetallic and maintaining structural integrity at high temperaturees and pressures of said forming conditions; applying compressive forces across said forming members to seal said cavity; bringing said at least one sheet to within a temperature range at which it exhibits superplastic characteristics; and applying pressure to said at least



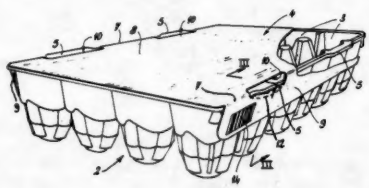
one sheet to superplastically form said at least one sheet into said cavity wherein said seal material is flaked graphite that has been heat treated to a temperature in excess of the superplastic forming temperature to be used for said at least one sheet to remove volatile contaminants therefrom.

4,603,809

PACKAGE WITH A BASE AND A COVER, ESPECIALLY FOR FOODSTUFFS SUCH AS EGGS

Alain Vilotte, Paris, and Alain Jacquart, Ferriere la Grande, both of France, assignors to Seprosy Societe Europeenne pour la Transformation des Produits de Synthese, Paris, France

Filed Feb. 21, 1985, Ser. No. 703,887
Claims priority, application France, Feb. 24, 1984, 84 03332
Int. Cl.[4] B65D *1/00*
U.S. Cl. 229—2.5 EC **12 Claims**



1. A package comprising:

a rectangular container having an upwardly open mouth formed with a pair of longitudinal edges and a pair of transverse edges, each of said longitudinal edges being formed along a rim of a respective longitudinal wall each of which is provided along the respective longitudinal edge with at least one outwardly extending projection, said longitudinal walls diverging upwardly and outwardly toward said mouth;

a cover extending over said mouth and composed of a flat relatively stiff material, said cover being formed with a pair of mutually parallel fold-score lines spaced apart by a distance greater than the lengths of said transverse edges, said cover being of a width greater than the width of said mouth whereby said cover has strips along its opposite longitudinal edges delimited by said fold-score lines, each of said fold-score lines being formed with a window adapted to receive a respective one of said projections; and

respective tongues projecting from each of said strips into the respective windows and adapted to be braced against an underside of the respective projection to hold the

respective strip in a downwardly and inwardly inclined orientation generally along a respective one of said longitudinal walls of said container.

4,603,810

METHOD AND APPARATUS FOR THE ACCELERATION OF SOLID PARTICLES ENTRAINED IN A CARRIER GAS

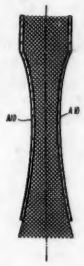
Francois Schleimer; Clement Burton; André Bock, and Jean Peckels, all of Esch, Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Mar. 8, 1984, Ser. No. 587,540

Claims priority, application Luxembourg, Mar. 11, 1983, 84686

Int. Cl.⁴ C21B 7/16; C21C 5/32

U.S. Cl. 239—1 **16 Claims**



1. A device for accelerating solid particles entrained in a carrier gas through a duct, the carrier gas flowing at subsonic speeds, said duct including exit section means terminating at an opening, the interior cross-section of said exit section means varying from a nominal value to a larger value over at least about 5 meters upstream from said opening whereby the subsonic velocity of said carrier gas increases at an approximately linear rate and whereby the velocity of said solid particles substantially approaches the velocity of said carrier gas at said opening.

4,603,811

INJECTION UNIT ASSOCIATED WITH EACH CYLINDER OF A MULTICYLINDER DIESEL ENGINE

Leopold Rollenitz, Kirchstetten; Harald Schmidt, Vienna; Otto Freudenschuss, Vienna, and Josef Morell, Vienna, all of Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

Filed May 10, 1984, Ser. No. 608,977

Claims priority, application Austria, Jun. 6, 1983, 2055/83

Int. Cl.⁴ F02M 47/02

U.S. Cl. 239—90 **4 Claims**

1. A fuel injection unit associated with each engine cylinder of a multi-cylinder diesel engine having an injection nozzle and an injection pump disposed in a common elongated housing, said injection unit actuated by cam means via a rocker lever and a longitudinally adjustable tappet, said injection pump comprising,

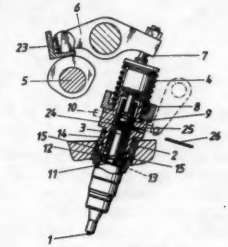
a pump cylinder having at least one fuel passage passing transversely therethrough,

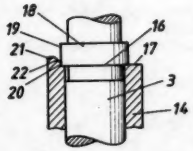
a rotatable pump piston disposed within said pump cylinder, said pump piston having a piston head with two inclined control edges, said control edges longitudinally spaced from each other on said piston head, said control edges cooperating with said fuel passage for receiving fuel into said pump cylinder and for injecting fuel into its associated engine cylinder via said injection nozzle,

said pump cylinder and said pump piston including adjustment means for simultaneously adjusting the longitudinal and rotational orientation of said pump piston relative to said pump cylinder upon installation of said fuel injection unit in its associated engine cylinder, said adjustment means comprising,

a first stop face located on said pump piston,

a second stop face located on said pump cylinder, said first and second stop faces extending transversely to the longitudinal axis of said pump cylinder, said first and second stop faces abutting against each other to fix the longitudinal position of said pump piston relative to said pump cylinder upon installation of said fuel injection unit in its associated engine cylinder,





a first engagement surface located on said pump piston, and

a second engagement surface located on said pump cylinder, said first and second engagement surfaces being substantially parallel to the longitudinal axis of said pump cylinder, said first and second engagement surfaces abutting against each other to fix the rotational orientation of said pump piston relative to said pump cylinder upon installation of said fuel injection unit in its associated engine cylinder.

4,603,812

FOAM-GENERATING PUMP SPRAYER

Paul R. Stoesser; John E. Cuzic, both of Midland, and John W. McLaren, Beaverton, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 301,797, Sep. 14, 1981, Pat. No. 4,463,905, which is a continuation-in-part of Ser. No. 919,595, Jun. 27, 1978, abandoned. This application May 21, 1984, Ser. No. 612,196

The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.

Int. Cl.⁴ B05B 1/26, 11/00

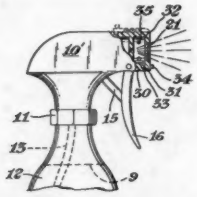
U.S. Cl. 239—329 **17 Claims**

1. A hand-held, foam-spraying apparatus for producing a foam comprising a liquid matrix containing discrete air bubbles and comprising in cooperative combination:

(a) a trigger-operated hand dispensing pump, including an atomizing nozzle, for drawing a foamable liquid from a container and ejecting it into the atmosphere through the atomizing nozzle, thereby forming a spray from such liquid and projecting the spray in a predetermined pattern outwardly from the atomizing nozzle, and

(b) foam-forming means operatively associated with the dispensing pump for producing foam from the spray using

air external to the apparatus and without substantially modifying the predetermined spray pattern, the foam-forming means consisting essentially of (1) a screen having a size generally in the range of about 60 to 200 mesh U.S. Sieve Series and being retained in the path of the spray a distance from the atomizing nozzle which is suitable for producing the result of a relatively dry foam, and (2)



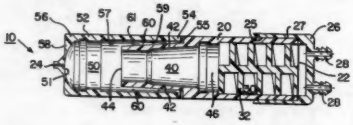
means for introducing air into the spray so that the spray is permitted to foam upon contact with the screen; the foam-forming means permitting the passage of substantially all the spray therethrough without contact except by the screen and being effective for generating a relatively dry foam having reduced tendency to drip when deposited on a vertical surface.

4,603,813

DOUBLE BACK SPRAY NOZZLE

Gregory J. Luegering, Morris, Ill., assignor to Insta-Foam Products, Inc., Joliet, Ill.

Filed Jun. 29, 1984, Ser. No. 626,332
Int. Cl.[4] B05B 7/04
U.S. Cl. 239—399 **7 Claims**



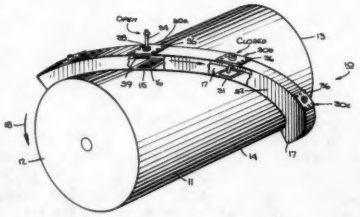
1. An expansion control mixing and dispensing nozzle adapted for attachment to an associated two-component liquid dispensing gun for mixing and dispensing liquid foamable products, said nozzle having a generally cylindrical exterior surface and comprising, in combination, a mixing chamber, a mixing chamber outlet tube and an outlet tube cover and nozzle discharge element, said mixing chamber having an axially extending, continuous side wall having inner surface portions defining at least a part of said mixing chamber, an end wall closing off the axially inner end of said mixing chamber and including a pair of spaced apart inlet ports for receiving the individual liquid components of said mixture, means disposed within said inner surfaces of said mixing chamber sidewalls for imparting a swirling action to expanding foamable materials passing through said mixing chamber, said mixing chamber outlet tube having axially inner and outer annular edge surfaces defining respectively a tube inlet communicating with the interior of said mixing chamber and tube outlet having a reduced cross-sectional area in relation to said tube inlet, said tube further including a radially outwardly continuous tube surface extending toward and meeting said axially outer edge surface of said tube outlet, said outlet tube cover and nozzle discharge element including an axially inner margin terminating in an end portion affixed to an outer part of said mixing chamber side wall, an axially outer margin having its edge portion joined to an inner end face cover surface closing off said tube cover and having spaced apart, longitudinally extending side walls defining a product discharge slot, and generally cylindrical, axially extending radially inwardly directed sidewall portions extending between said axially inner and outer ends of said tube cover and discharge element to define a pre-discharge chamber adjacent the axially outer end of said cover and discharge element, and an annular auxilliary chamber lying between said axially inner margin of said inwardly directed tube cover sidewalls and said radially outwardly directed tube surface of said outlet tube.

4,603,814

SYSTEM FOR DISCHARGING ROTARY MILLS

James C. Mehltretter, Allendale; Winfred L. Woodard, III, Midland Park; John J. Orlando, Rivervale, all of N.J., and Charles B. Goodrich, Daytona Beach, Fla., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Mar. 15, 1985, Ser. No. 712,704
Int. Cl.[4] B02C 17/18
U.S. Cl. 241—30 **26 Claims**



1. A discharge system of a batch-type, rotary grinding mill, which mill is operable under seal to the atmosphere, comprising:

(a) a rotatably mounted shell having two ends and an outer side wall, means to rotate the shell, a plurality of grinding media within the shell, at least one discharge port through the outer side wall of the shell, and blocking means securable to each discharge port for preventing passage of the grinding media outwardly through said discharge port;

(b) closure means for sealing each discharge port;

(c) at least one discharge chute sealably secured to the outer side wall of the shell to receive discharge material from the shell, said chute having at least one entry port, each entry port being aligned with a discharge port and sealably covering the discharge port relative to the atmosphere, said chute spiraling adjacent to the outer wall of the shell and traversing the outer wall of the shell from one end to the other, and said chute having an unloading port;

(d) a rotatable hollow trunnion mounted axially at one end of the shell, said trunnion having a receiving and discharge end, the receiving end being adapted to receive discharge material from the unloading port of the discharge chute;

(e) conveyor means in the hollow trunnion for advancing material to the discharge end of the trunnion;

(f) non-rotating delivery means sealably mounted to the discharge end of the rotatable hollow trunnion, said delivery means being sealable to the atmosphere and serving as a passageway for discharge material from the trunnion out of the mill; and

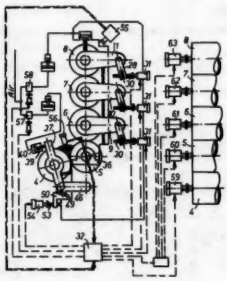
(g) sealable unloading means for removing the discharge material from the mill under seal to the atmosphere.

4,603,815

CONTROLLED OPERATION CHOCOLATE REFINER

Sergio Ripani, and Giulio Serafini, both of Milan, Italy, assignors to Carle & Montanari S.p.A., Milan, Italy

Filed Mar. 1, 1984, Ser. No. 585,297
Claims priority, application Italy, Jun. 29, 1983, 21857 A/83
Int. Cl.[4] B02C *4/04*
U.S. Cl. 241—36 3 Claims



1. A refiner for mixtures and suspensions having non-Newtonian rheological characteristics, such as chocolate, inks, and paints, comprising, carried in a frame, a pair of feeding rollers for feeding in a chocolate paste to be refined, and a plurality of refining rollers and actuators therefor, and means effective to cause a pressure change on the supports for the refining rollers; characterized in that it comprises in combination:

(a) means effective to produce a change in the crowning of the refining rollers;

(b) means effective to produce a change in the crowning of one feeding roller;

(c) means effective to produce a speed change in said refining rollers;

(d) means effective to produce a change in the pressure on the refining rollers;

(e) first and second gauge means for measuring pilot chocolate parameters of viscosity and thickness, respectively, whereby either one or both of the measured values are utilized for controlling corrective actions; and

(f) a microprocessor control unit responsive to signals indicative of either one or both of the measured values of said parameters, for centrally controlling corrective actions on the operation to be applied to said means effective to produce a change in either one of a combination of the crowning, the speed, and the pressure on the refining rollers and on a feeding roller, thereby providing proper refining of various types and mixtures of chocolate, irrespective of the starting physical and chemical characteristics thereof, and as same vary during refiner operation.

4,603,816

ROTARY SHREDDER

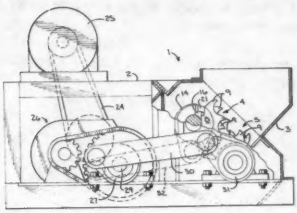
Martin H. Panning, Thiensville, Wis., assignor to Blower Application Company, Germantown, Wis.

Filed Oct. 1, 1982, Ser. No. 432,183
Int. Cl.[4] B02C *1/00*
U.S. Cl. 241—266 12 Claims

1. A rotary shredder, comprising:

first and second cooperating shredding rotors rotatably mounted adjacent to one another and each rotating about an axis, each rotor includes a plurality of axially spaced ripper blades positioned so that the blades of one rotor are located adjacent to the blades of the other rotor; and

drive means in driving engagement with said rotors to bi-directionally rotate each rotor about its axis during a normal shredding cycle while shredding material by the relative rotational oscillatory motion between said rotors and during at least a portion of said cycle said first and second rotors rotate in the same direction so that said first



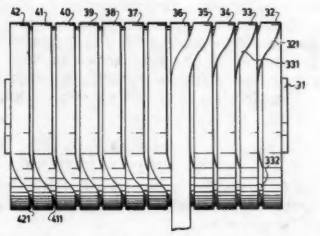
rotor advances while simultaneously said second rotor retracts to shred material fed therebetween.

4,603,817

PACKAGE OF TAPE

Lawrence J. O'Connor, 6027 Southboine Dr., Winnipeg, Manitoba, Canada R3R 0B5

Division of Ser. No. 462,558, Jan. 31, 1983, Pat. No. 4,477,035.
This application Jul. 12, 1984, Ser. No. 630,199
Claims priority, application United Kingdom, Feb. 4, 1982, 8203185
Int. Cl.[4] B65H *18/28*
U.S. Cl. 242—1 18 Claims



1. A package of tape comprising a right circular cylindrical winding surface having tape wound around an axis thereof while traversing axially relative to said package repeatedly to form a pair of separate axially spaced end positions on the package resulting from repeatedly winding said tape spirally to form a plurality of separate spiral windings of at least two full turns, and a helical traverse disposed between each separate spiral winding to connect the spiral winding to another position on said package such that each spiral winding forms a right circular cylindrical step at a respective one of the end positions of increased radial height relative to the radial height of said another position which has not been increased, said another position including further wraps of tape to build the radial height thereof up to said step, wherein each helical traverse from said end position to said another position is arranged such that it is angularly spaced from the preceding underlying helical traverse from said end position to said another position and the height of each step being such that substantial deformation of the tape and interference with said traverse are avoided as the tape descends from said step and such that the helical traverses are sufficiently frequent to interlock said end position with said another position at spaced locations throughout its radial and angular dimension to provide the package with stability and resistance to telescoping or collapse.

4,603,818
BOBBIN INSERTING DEVICE

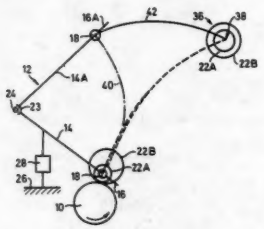
Rudolf Luz, Horgen, and Günter Gärtner, Lucerne, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 18, 1984, Ser. No. 611,676

Claims priority, application United Kingdom, May 20, 1983, 8313994

Int. Cl.[4] B65H *67/04, 54/22*

U.S. Cl. 242—35.5 A **9 Claims**



1. In a yarn handling machine, the combination comprising
a cradle mechanism having a pair of parallel arms for receiving a bobbin therebetween and being movable along a first path of movement between a bobbin transfer location and a yarn winding position; and
a bobbin inserting device including a bobbin gripper for engaging a bobbin at a bobbin collection position and a carrier movable along a second fixed path of movement for moving said gripper from said collection position through said transfer location to said yarn winding position, said gripper being movably mounted on said carrier to move with said cradle mechanism during joint movement of said cradle mechanism and said carrier from said transfer location to said yarn winding position.

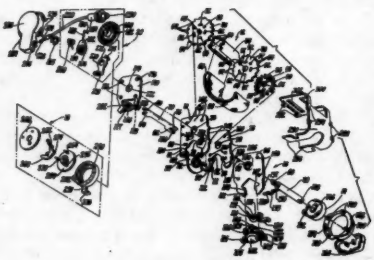
4,603,819
SEAT BELT RETRACTOR

Richard D. Loose, Birmingham, and Joseph W. Struck, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 580,375, Feb. 22, 1984, abandoned, Continuation-in-part of Ser. No. 487,977, Apr. 25, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 788,090

Int. Cl.[4] B60R *22/38, 22/40*

U.S. Cl. 242—107.4 A **4 Claims**



1. A seat belt retractor comprising:
a belt reel;
a frame having a base wall adapted for attachment on a vehicle body and first and second spaced apart side walls with aligned apertures for receiving a reel shaft to rotatably mount the belt reel between the side walls;
a generally planar support member adapted to abut against one of the frame side walls on the face thereof opposite the belt reel and carry a control mechanism operative to control rotation of the belt reel relative to the frame;
a cover adapted to abut against the support member and enclose the control mechanism; and
wherein each of said first and second side walls and said support member have similarly configured and aligned apertures therethrough and wherein said cover has plug-in securing elements matingly configured and aligned with the apertures of the first and second side walls and the support member whereby to enable interchangeable and optional utilization of said support member and the control mechanism carried thereby on either of said first and second side walls of the retractor frame.

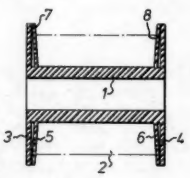
4,603,820
THREAD REEL

Stig E. E. Olofsson, Angantyrvägen 36, S-182 64 Djursholm, Sweden

Filed Mar. 5, 1985, Ser. No. 708,468

Int. Cl.[4] B65H *75/14, 75/28, 65/00*

U.S. Cl. 242—118.4 **7 Claims**



1. A thread reel comprising a cylindrical part (1) having an outer flange (3) (4) integral with each end of said cylindrical part, an inner flange (5) integral with said cylindrical part and spaced from and adjacent to one (3) of said outer flanges, the spacing between said adjacent inner (5) and outer (3) flanges being somewhat greater than the thickness of the thread to be wrapped about said cylindrical part of said thread reel, said inner flange being of sufficiently flexible construction whereby its peripheral edge (7) is pressed into contact with the outer flange (3) by the thread as said thread is wrapped around the cylindrical part (1) of the reel between said outer flange (4) and said inner flange (5) to substantially the height of said inner flange (5).

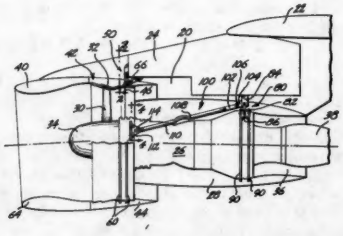
4,603,821
SYSTEM FOR MOUNTING A JET ENGINE

John L. White, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1983, Ser. No. 567,221

Int. Cl.[4] B64D *27/18*

U.S. Cl. 244—54 **10 Claims**



1. A system for securing a jet propulsion engine to an air-

craft, the engine having a core assembly, a fan powered by the core assembly and a fan casing enclosing the engine fan, said securing system comprising:

first means extending between the fan casing and the aircraft for securing the fan casing against lateral and vertical movement relative to the aircraft;

second means for securing the fan casing against pitch movement relative to the aircraft during normal operation of the aircraft, said second securing means comprising substantially rigid fan casing link means oriented generally longitudinally relative to the engine to transmit forces imposed on the fan casing along a vector component extending longitudinally relative to the engine, said fan casing link means connected at one end to the aircraft at a location longitudinally spaced from the location of the connection between the first securing means and the aircraft and connected at the opposite end closely adjacent the location of the connection between the first securing means and the fan casing; and,

third means for securing the engine core assembly to the aircraft to retain the engine against lateral, vertical and torsional movement relative to the aircraft, said third securing means includes an elongate thrust yoke disposed generally longitudinally relative to the engine axis of rotation, said thrust yoke having a forward end portion secured to a forward portion of the engine core assembly at locations relative to the diametrical center of the engine axis of rotation toward the circumferential location at which said fan casing link means is connected to the fan casing.

4,603,822

AFT ENGINE MOUNT

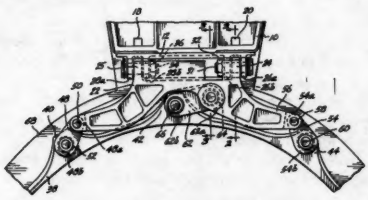
Wan T. Chee, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/01931, § 371 Date Dec. 8, 1983, § 102(e) Date Dec. 8, 1983, PCT Pub. No. WO85/02596, PCT Pub. Date Jun. 20, 1985

PCT Filed Dec. 8, 1983, Ser. No. 578,072

Int. Cl.[4] B64D *27/00*

U.S. Cl. 244—54 **11 Claims**



1. In an aircraft having a jet engine mounted to and beneath a wing thereof wherein said engine is a predetermined distance from said wing and wherein further said engine is mounted on a strut affixed to said wing, a low-profile engine mount assembly attachable to said strut and said engine to hold said engine on said strut, said engine mount assembly constructed and arranged to occupy a minimum portion of the distance between said engine and said wing so as to provide the maximum strut vertical dimension so as to keep said engine mount within the contour of a cowl surrounding said engine, said engine mount assembly including a yoke assembly having a first arm and a second arm,

yoke-mounting means for mounting said yoke assembly to said strut so as to permit pivotal movement of said yoke about an axis substantially orthogonal to the axis of said engine, and

means for mounting said first and second arms of said yoke assembly to said engine including a mounting ring affixed to said engine, first link means pivotally attached at a first end thereof to said first arm and pivotally attached at a second end thereof to said mounting ring, second link means pivotally attached at a first end thereof to said second arm and pivotally attached at a second end thereof to said mounting ring, said first ends of said first and second links being pivotable about axes substantially parallel to said engine axis and said second ends of said first and second links being substantially universally pivotable.

4,603,823

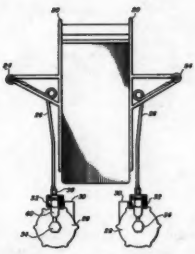
AIRSPEED SENSING PRESSURE VALVE SYSTEM

Peter Ayoub, Bryn Mawr, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1984, Ser. No. 627,307

Int. Cl.[4] B64D *17/54*

U.S. Cl. 244—122 AE **3 Claims**



1. A pressure-sensitive device for selectively delaying deployment of a parachute in an ejection seat system of an aircraft having a gas powered catapult, said pressure-sensitive device comprising in combination:

an ejectable seat frame;

first sensing means attached to said seat frame responsive to static air pressure for determining the aircraft's altitude at the time of ejection;

second sensing means including a pair of pitots attached to opposite sides of said seat frame responsive to dynamic airstream pressure;

mode select means including a pair of sensors attached to opposite sides of said seat frame and connected to receive the static and dynamic pressures from said first and second sensing means, for comparing the static and dynamic pressures received and for selectively delaying the deployment of the parachute should the difference between the static and dynamic pressures fall below a predetermined value;

arming means, connected between the catapult and said mode select means, for preventing actuation of said mode select means until such time that said second sensing means is exposed to dynamic airstream pressure; and

storing means for storing a maximum dynamic airstream pressure, said storing means including a pair of pressure-sensitive check valves each connected between respective ones of said pitots and sensors.

4,603,824

WING SLAT ANTI-ICE AIR DUCT SYSTEM WITH IMPROVED SLIDE BEARINGS AND AIR SEAL

Richard C. McArdel, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

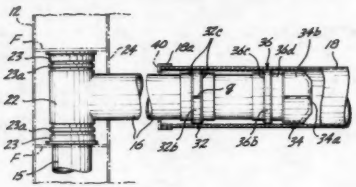
Filed Aug. 12, 1983, Ser. No. 522,661

Int. Cl.[4] B64D *15/04*; B64C *21/04*

U.S. Cl. 244—134 B **2 Claims**

1. In an anti-icing duct means for aircraft retractable/deployable wing slats wherein the leading edge of the aircraft wing houses a longitudinal main supply duct carrying pressur-

ized anti-icing air and the leading edge of the slat houses a longitudinal spray duct for distributing anti-icing air against the slat, and wherein the duct means comprises telescoping transfer ducts interconnected between the supply duct and the spray duct, and wherein the transfer ducts comprise an inner duct having one end telescopically received within one end of an axially aligned outer duct, and wherein slide bearing means are fixedly mounted on the exterior of the inner duct along the portion thereof that remains within the outer duct throughout retraction and deployment of the wing slat, and wherein the slide bearing means slidably engages and supports the interior wall of the outer duct, and wherein air seal means are fixedly mounted to the exterior of the inner duct and slidably engage the interior wall of the outer duct throughout deployment and



retraction of the wing slats, an improved bearing means including:

two annular slide bearings fixedly mounted on the inner duct for sliding engagement with the interior of the outer duct at positions spaced-apart lengthwise on the inner duct, one slide bearing being located at the end of the inner duct positioned within the outer duct, the other slide bearing being located so as to lie inside the end of the outer duct when the inner and outer ducts are in slat deployed position, each of said annular slide bearings comprising:

(i) a pair of flanged retainer elements affixed to the inner duct;

(ii) split-ring slider elements of low-friction synthetic material enclosed between each pair of retainer elements.

4,603,825

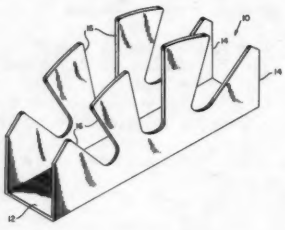
TACO HOLDER

Howard J. Kotliar, 9-28 Pond View, East Patchogue, N.Y. 11772

Filed Jun. 14, 1984, Ser. No. 620,487

Int. Cl.[4] A45D *19/04*

U.S. Cl. 248—174 **4 Claims**



1. A taco holder made from a single flat sheet of material folded along previously prepared fold lines comprising an extended flat portion having a pair of side walls coextensive with the length of said flat portion and means formed in each of said side walls to permit exposure of said taco to grasping by the fingers of the eater of said taco down to the last mouthful thereof while at the same time maintaining upright support of said taco, said formed means consisting of radially extending slots of varying width and depth to accommodate fingers extending from the upper edges of said walls to points close enough to said flat member to support a single mouthful of said taco.

4,603,826

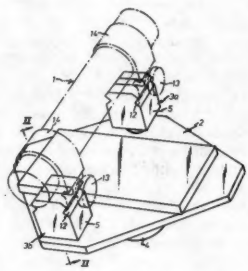
MEANS FOR ADJUSTING A SIGHTING INSTRUMENT IN RELATION TO A SUPPORT

John A. I. Ekstrand, Utteröd 1, S-240 33 Löberöd, Sweden

Filed May 8, 1984, Ser. No. 608,245

Int. Cl.[4] A47B *96/06*

U.S. Cl. 248—205.1 **1 Claim**



1. Adjustable mounting apparatus for adjusting a sighting instrument in relation to a support means, said apparatus comprising a pair of hollow support blocks for supporting said sighting instrument at two longitudinally spaced points, each supporting block having groove means at opposite sides thereof for cooperation with a clamping device for securing said sighting instrument to said block, each block also having a chamber with an open end disposed so as to face said support means, and further having associated means for connecting said block to said support means in adjustable spaced relation to said support means, said associated connecting means including compressible spring means mounted within said chamber and projecting through said open end thereof for resiliently supporting said block in spaced relation to said support means, and adjustable compression screw means for adjusting the degree of compression of said spring means, said screw means extending from said support means into a threaded bore which extends into said block from the base of said chamber, said screw means being threadably received in said bore and said spring means constituting an elastic spacer between said support block and said support means, whereby adjustment of said screw means effects a change in the angle between the longitudinal axis of said sighting instrument and a selected plane fixed relative to said support means.

4,603,827

SHEET METAL MOUNTING DEVICE

Robert Greenberg, Los Angeles, Calif., assignor to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.

Filed Apr. 15, 1982, Ser. No. 368,522

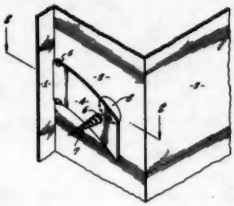
Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—542 **11 Claims**

1. A device for in combination with a sheet metal insert for permanently securing said insert into a framed rough wall cavity of varying dimensions which device comprises:

one or more tabs, each tab being rigidly attached to a point on the outside of the periphery of the insert and extending to another portion within the cavity along the outside of the insert, each tab further containing a means for attaching the extending end tab to the framed wall cavity said

tabs being sufficiently rigid to support the insert and sufficiently flexible to permit adjustable spacing between the



attachment to the insert and the attachment to the frame; and

a means to access the tab from the inside of the insert.

4,603,828

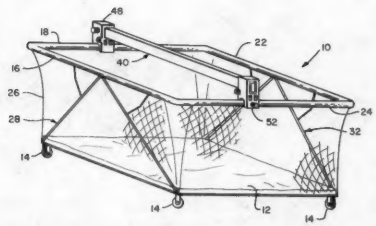
KINDER BAR AND KINDER GROW

Owen E. Farley, Jr., 29 Continental Dr., Centereach, N.Y. 11720, and Gerard T. Hopkins, 24 Heritage La., Natick, Mass. 01760

Filed Mar. 25, 1985, Ser. No. 715,840

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—542 **4 Claims**



1. Toy holder and exercise bar apparatus for use with playpen and the like having spaced side rails comprising a rod member of hollow, rectangular construction, a side rail bracket for each of the ends of said rod member for mounting on each of said spaced side rails, each said bracket consisting of a main body having an opening therethrough to accommodate one end of said rod member, means on said main body to accommodate a first screw member threaded therethrough to engage and lock said rod member against movement, a U-shaped portion extending from said main body to overlap one of said side rails for supporting said rod member on said side rail, means on said U-shaped portion to accommodate a second screw member threaded therethrough to engage the side rail so as to lock said apparatus against movement, said means to accommodate a second screw member being located on the side of said bracket away from the opposite side rail, and a pair of tab members mounted on opposite sides of each bracket flush with the side facing the opposite side rail with an opening through each of said tab members to accommodate a screw member, said side having a flat surface, thereby permitting said apparatus to be utilized within a closet or other compartment as a hanger for clothes and the like, each bracket being mounted on an oppositely facing wall, with the tabs and adjoining flat surface being flush against said wall supported by said screw members and said rod member supported at the ends thereof by each of said brackets.

4,603,829

SYSTEM FOR FIXEDLY MOUNTING A CASE OR THE LIKE BOX-SHAPED ARTICLE

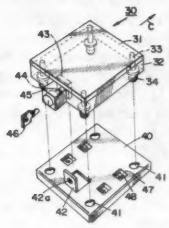
Noboru Koike, Sagamihara; Hidenari Kitamura, Hachioji, and Tsuneo Tomita, Kunitachi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 31, 1984, Ser. No. 646,106

Claims priority, application Japan, Aug. 31, 1983, 58-135912[U]

Int. Cl.[4] F16M *3/00*

U.S. Cl. 248—553 **9 Claims**



6. In a system for fixedly mounting a case or the like box-shaped article, the improvement comprising:

in combination a case or the like and a mounting base, engaging means for engaging one surface of the case to one surface of the mounting base, and

displacing means for displacing the case relative to the mounting base after the former is placed on the surface of the latter so that the former is firmly engaged to the latter, said displacing means including a pressure actuated piece disposed at the force end of the mounting base and a tongue disposed on the case at a position located opposite to said pressure actuated piece and adapted to come into pressure contact with a surface of the pressure actuated piece.

4,603,830

SPRING MOUNTING APPARATUS

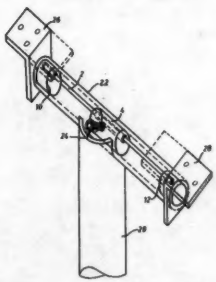
Klaus Franck, Hanover, Fed. Rep. of Germany, assignor to Wilkhahn Wilkening and Hahne GmbH & Co., Bad Munder, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,477

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 3335148

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—575 **6 Claims**



1. Spring mounting apparatus for a pair of relatively tiltable members, said apparatus comprising a pair of spaced apart, coaxial bearings; an intermediate bearing interposed between

the bearings of said pair; means mounting the bearings of said pair on one of said members; means mounting the intermediate bearing on the other of said members and coaxially with the bearings of said pair; means restraining the intermediate bearing from rotation; and at least one elongate spring rod spanning all of said bearings and being journaled in at least the intermediate bearing for rotation relative thereto about its own axis, the axis of said rod being spatially offset relative to the axes of said bearings.

4,603,831

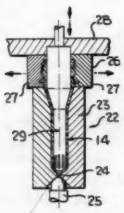
MOLD CORE MEMBER FOR USE IN A MOLD UNIT FOR INJECTION MOLDING A PLASTIC MATERIAL PREFORM FOR A BLOW MOLDED CONTAINER

Suppayan M. Krishnakumar, Nashua, N.H.; Kenneth F. M. Friendship, Clarendon Hills, Ill.; Gautam K. Mahajan, Nashua, N.H., and John F. E. Pocock, Neu-Isenburg/Hessen, Fed. Rep. of Germany, assignors to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 97,603, Nov. 27, 1979. This application Sep. 20, 1982, Ser. No. 420,061

Int. Cl.[4] B29C *45/03, 49/06*

U.S. Cl. 249—144 **6 Claims**



1. In a mold unit for injection molding a plastic material preform for a blow molded container wherein the preform has an internal arrangement of longitudinally extending ribs, a mold core member having a lower portion terminating in an end portion, said lower portion of said core member defining only that portion of the preform which becomes a bottom of the resultant bottle, and an arrangement of longitudinally extending rib defining grooves of limited longitudinal extent formed only in said core member lower portion, said grooves having londitudinally open lower ends.

4,603,832

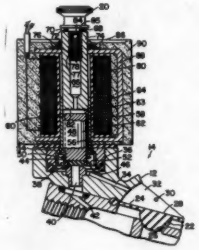
SOLENOID ACTUATOR WITH BLEED SCREW

Dennis R. Sjoquist, Yorba Linda, Calif., assignor to Evolutionary Concepts, Inc., San Dimas, Calif.

Filed Jun. 7, 1985, Ser. No. 742,519

Int. Cl.[4] F16K *31/385, 31/40*

U.S. Cl. 251—30.02 **12 Claims**



1. A solenoid actuator for controlling a pressure diaphragm valve by relieving the closing pressure thereof maintained at a first valve seat thereof including:

an armature positioned to normally close the first valve seat;

a coil positioned to move said armature to open the first valve seat to relieve the closing pressure on the pressure diaphragm valve;

manual relief means in communication with the closing pressure acting on the pressure diaphragm valve whereby said manual relief means upon manual actuation relieves the closing pressure on the pressure diaphragm valve and thus allows it to open, said manual relief means including:

a hollow threaded body having:

a shoulder surface; and

a bleed screw positioned in said hollow threaded body having:

a bleed screw relief passageway therethrough in communication with the closing pressure acting on the pressure diaphragm valve; and

means for sealing said bleed screw relief passageway; and

a hollow housing in which said armature is slidably positioned and in which said hollow threaded body is fixed.

4,603,833

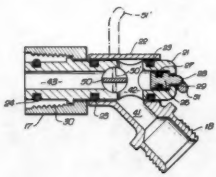
INLET VALVE FOR BREATHING APPARATUS SECOND STAGE REGULATORS

Tony Christianson, 120 8th St., Manhattan Beach, Calif. 90266

Filed Jun. 14, 1982, Ser. No. 388,176

Int. Cl.[4] F16K *35/00, 35/02, 31/143*

U.S. Cl. 251—94 **2 Claims**



1. An inlet valve for use with a breathing regulator second stage which is connectable to a source of breathable gas, comprising:

a valve body having a passage therethrough, said body containing a flow-closing valve in said passage, and being connectable in the gas circuit to said second stage,

a control member for said valve extending externally of of said body,

a detent member attached to said body and having an element projecting externally to said body and being urged into an orientation in which said element retains said control member with said valve in the open, flow enabling position, and wherein said detent member comprises:

a piston in said body having an end within said passage and exposed to the inlet gas pressure therein, said piston having an element projecting through an opening in said body and situated so that said control member will be retained with the valve in the open, flow enabling position when said piston element is urged outwardly of said body by pressure of gas from said source.

4,603,834

MOUNTING OF DISK IN A DISK VALVE

Fred W. Hendrick, Long Beach, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 19, 1984, Ser. No. 591,022

Int. Cl.[4] F16K *47/00*

U.S. Cl. 251—121 **19 Claims**

1. An orifice valve comprising:

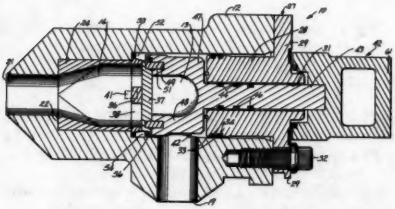
a valve body defining coaxial, adjoining upstream and

downstream chambers, said upstream chamber having a generally cylindrical larger transverse cross-sectional area than the downstream chamber, the downstream chamber having an oblong transverse cross-section, to thereby form an annular shoulder having a generally circular outer perimeter defined by the configuration of the upstream chamber and a generally oblong inner perimeter defined by the configuration of the downstream chamber;

a pair of diametrically opposite blind holes in the shoulder, each of the holes being generally at a position wherein the distance between the inner perimeter and the outer perimeter of the shoulder is at a maximum;

a stationary downstream disk mounted in the upstream chamber against the shoulder comprising a pair of fluid openings through the downstream disk and a pair of blind holes, each of the holes being in direct communication with a blind hole in the shoulder;

a rigid pin disposed in each blind hole in the shoulder of the valve body and extending into a directly communicating blind hole in the downstream disk to thereby prevent rotation of the downstream disk;



a rotatable upstream disk mounted in the upstream chamber in face-to-face engagement with the downstream disk comprising a pair of fluid openings through the upstream disk which can be aligned with the fluid openings in the downstream disk and a pair of blind holes extending into the upstream disk from the face of the upstream disk remote from the downstream disk;

an operator member for rotating the upstream disk comprising:

a handle outside of the valve body;

a stem fixedly attached to the handle and extending from the handle through the valve body and into the upstream chamber; and

a disk engaging member fixedly attached to the stem having at least one surface adjacent the upstream disk and a pair of blind holes extending into the disk engaging member from said surface, each of the holes being in direct communication with a blind hole in the upstream disk; and

a rigid pin disposed in each blind hole in the upstream disk and extending into a directly communicating blind hole in the disk engaging member.

4,603,835

SHUTTER MECHANISM

Charles F. deMey, II, West Redding, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 9, 1983, Ser. No. 549,952
Int. Cl.[4] F16K *31/44*
U.S. Cl. 251—215 **11 Claims**

1. A shutter mechanism comprising:

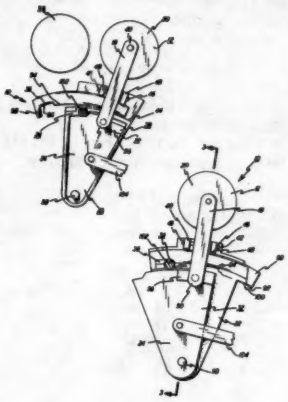
a shutter control member;

means for rotating said shutter control member between a first position and a second position;

a shutter carrier plate;

means for interlocking said shutter carrier plate with said shutter control member during a first portion of the rotation of said member between said first and said second position;

means for releasing said shutter carrier plate from said shutter control member during a second portion of said rotation between said first and said second positions;



a shutter plate, said shutter plate being pivotable in a plane different than the rotation plane of said shutter control member; and

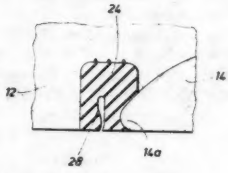
means for engaging said shutter plate with said shutter control member during said second portion of said rotation of said member during which said shutter plate is pivoted against a wall whereby a port can be covered.

4,603,836

BALL VALVE WITH PRELOADED SEALS AND METHOD OF MANUFACTURE

Richard Godfrey, 21819 Lake End, Kingwood, Tex. 77339

Filed Mar. 18, 1985, Ser. No. 712,765
Int. Cl.[4] F16K *5/06*
U.S. Cl. 251—315 **3 Claims**



1. A rotary valve, comprising

a rotary member having

an outer surface forming at least a segment of a sphere,

a passage through to opposite sides of the segment, and

an annular recessed surface in the segment abutting and surrounding one end of the passage,

a flow passage member adjacent to said rotary member comprising at least a segment of a sphere in slidable contact with the segment of the sphere of said rotary member, the flow passage of said flow passage member being aligned with said rotary member passage when said rotary member passage is in its open position, said flow passage of said flow passage member having an inside perimeter no larger than the inside perimeter of said rotary member passage, and

a resilient annular seal rigidly affixed between said rotary member and said flow passage member with its inside

perimeter being substantially the same dimension as said flow passage of said flow passage member, said seal having an inside perimeter cleft which allows axial closing flexing thereof when said rotary member is rotated to its closed position and allows axial opening flexing of said seal into said annular recessed surface when said rotary member is rotated to its open position.

4,603,837

TAP OR VALVE

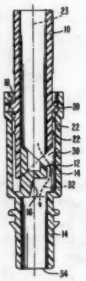
Peter L. Steer, Surrey, England, assignor to Craig Medical Products, Limited, England

Filed Jul. 25, 1985, Ser. No. 758,911

Claims priority, application United Kingdom, Aug. 15, 1984, 8420700

Int. Cl.[4] F16K *31/00*

U.S. Cl. 251—352 **5 Claims**



1. A tap or valve which includes a first tube and a second tube which are relatively rotatable about a common axis, each of said first and second tubes having a portion of its wall cut away, said portion extending around only a part of the periphery of the respective tube, and one of said first and second tubes being rotatable relative to the other between an "open" position in which the apertures defind by the cutaway portions overlap partly or wholly and a "closed" position in which the aperture defined by a cutaway portion of each of said first and second tubes is overlapped by a portion of the wall of the other of said first and second tubes, wherein said second tube is mounted internally of a third external tube and said first tube fits relatively rotatably within the external tube while said second tube fits snuggly, but relatively rotatably, within said first tube.

4,603,838

BALL VALVE SEAT

H. Gotch, Sunbury, United Kingdom, assignor to Grundy (Teddington) Limited, Middlesex, England

Filed Aug. 13, 1985, Ser. No. 765,250

Claims priority, application United Kingdom, Aug. 13, 1984, 8420518

Int. Cl.[4] F16K *39/00*; F16L *55/18*

U.S. Cl. 251—361 **9 Claims**

1. A ball valve seat comprising:

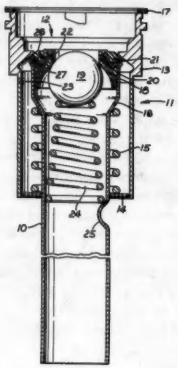
a. a first annular reinforcement member;

b. a second annular reinforcement member;

c. said first annular reinforcement member further comprising a skirt portion and a narrower-diameter neck portion;

d. said second annular reinforcement member being in the form of a ring and having in the region of its inner periphery a groove to accept the neck portion of said first annular reinforcement member; and

e. an annular resilient body serving to maintain said first annular reinforcement member and said second annular reinforcement member in a predetermined relationship with said second annular reinforcement member extending radially outward of the first annular reinforcement member over the outer periphery of its skirt portion.



4,603,839

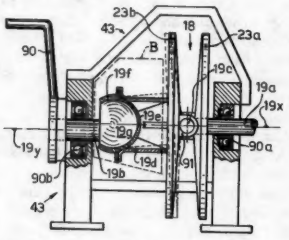
DEVICE FOR TRANSPORT OR DISPLACEMENT OF ELONGATED OBJECTS IN PARTICULAR, AS WELL AS A PULLING OR TRACTION WHEEL COMPRISED IN SAID DEVICE

Uno Ekman, and Leif Hjert, both of Vänersborg, Sweden, assignors to Igelfors Bruks AB, Finspäng, Sweden

Filed May 27, 1983, Ser. No. 499,143

Int. Cl.[4] A01K *73/06*; B66D *1/30*

U.S. Cl. 254—329 **16 Claims**



2. An apparatus for longitudinally displacing elongated objects, comprising:

a first shaft rotatable about a first axis of rotation;

a second shaft having a second axis of rotation, said second axis of rotation intersecting said first axis of rotation at an angle, said second axis of rotation comprising a generatrix of a cone of revolution, said cone having a vertex at said intersection of said first and second axis, the top (apex) angle of said cone being equal to said angle between said first and second axes;

a first disc secured to said first shaft, said first disc having a first, substantially conical surface;

a second disc rotatable about said second axis of rotation, said second disc having a second substantially conical surface substantially opposing said first substantially conical surface of said first disc, said first and second substantially conical surfaces defining therebetween an interspace having a substantially V-shaped cross section and extending substantially circumferentially around said discs;

means for rotating said first and second discs together; and

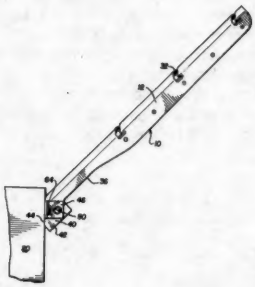
means for rotating said second axis of rotation around the axis of revolution of said cone.

4,603,840

FENCE SUPPORT MEMBER

Frank Simkin, 2 Candlemaker Ct., Baltimore, Md. 21208

Filed Jan. 9, 1985, Ser. No. 690,590
Int. Cl.[4] E04H *17/00*
U.S. Cl. 256—11 20 Claims



1. A fence support member to attach to a structural member having a straight side surface comprising:

an elongated support arm having means for receiving and engaging wire strands, and,

fastening means for fastening said support arm to the structural member,

said fastening means being received by the support arm,

said support arm having a first end which is designed to abut the straight side surface of said support member,

said first end having first and second abutment surfaces, said abutment surfaces being located on the edge of the first end of said support arm,

said first and second abutment surfaces being at an acute angle with each other and being designed to selectively abut the straight side surface of the structural member,

said first and second abutment surfaces being designed and arranged such that when said first abutment surface is in abutment with the straight side surface, the support arm forms a first angle with the structural member, and when the second abutment surface is in abutment with the straight side surface, the support arm forms a second angle with the structural member,

said fastening means including a pair of brackets, one bracket positioned on each side of the support arm.

4,603,841

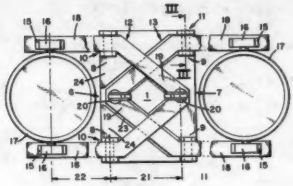
LADLE SUPPORT MACHINE

Werner Scheurecker, and Alois Scheinecker, both of Linz, Austria, assignors to Voest-Alpine International Corporation, New York, N.Y.

Filed Jun. 14, 1984, Ser. No. 620,880
Int. Cl.[4] C21B *3/00*
U.S. Cl. 266—44 25 Claims

21. A method for operating a ladle at a ladle support tower in a continuous casting plant comprising sensing the inclination of a ladle support disposed at a ladle support arm with an inclination measurement sensor, where the ladle support arm has the shape of a yoke surrounding the rotatable column and having a U-shaped planar projection and where two support arms are running about in parallel and each extending an end of the yoke with a ladle support disposed near an end of each support arm and where a support means for each support arm is disposed between the ladle support and the yoke for supporting the support arm on the side of the column disposed toward the corresponding ladle;

feeding the signal from the inclination measurement sensor to a control provision; and



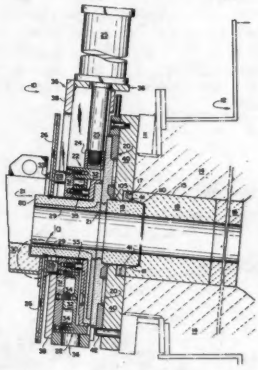
actuating a motion of the ladle support with the control provision.

4,603,842

METHOD OF SLIDING GATE VALVE OPERATION

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Division of Ser. No. 602,828, Apr. 23, 1984. This application May 16, 1985, Ser. No. 734,493
The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.
Int. Cl.[4] F16K *51/00*
U.S. Cl. 266—44 7 Claims



1. The method of operating a valve which is secured to the side portion of a container for molten metal, in which the valve has a stationary refractory surface having an orifice in open communication with and adjacent a tap opening in the furnace having a substantially horizontal axis, and in which a slide gate is movably mounted in a carrier having means for applying a pressure face to face relationship to the stationary plate, and in which an erosion pocket is formed between the slide gate and refractory surface at the respective closure edges of each in the direction of shut-off, comprising the steps of:

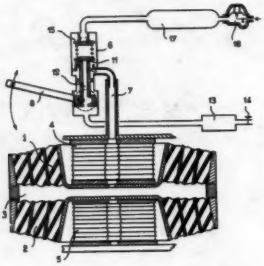
closing the slide gate by moving the same upwardly against the stationary plate,

whereby said erosion pocket faces downwardly when the shut-off is completed permitting drainage of the erosion pocket wherein said refractory surface is a removable plate.

4,603,843
RUBBER MOUNT WITH ELASTIC CONTROL

Jean-Pierre Bechu, Courbevoie, France, assignor to Caoutchouc Manufacture et Plastiques, France

Filed Apr. 23, 1984, Ser. No. 603,157
Claims priority, application France, Apr. 22, 1983, 83 06613
Int. Cl.[4] F16F *13/00*
U.S. Cl. 267—35 13 Claims

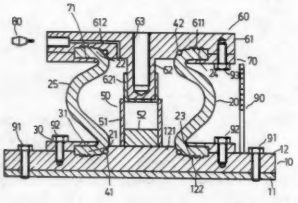


1. A pneumatic vibration insulation arrangement for a load, the arrangement comprising means defining a variable volume chamber means for supporting at least a portion of an air load, means for supplying a pressure to said variable volume chamber means for supporting a remainder of the load including first enclosure means providing a supply pressure to said variable volume chamber means, second enclosure means providing at least one of a modulated pressure or a pressure adapted to be slowly brought to atmospheric pressure to said variable volume chamber means, means for selectively communicating said first and second enclosure means with said variable volume chamber means in such a manner that upon establishing communication between the variable volume chamber means and at least one of the first and second enclosure means, a predetermined pressure is applied to said variable volume chamber means so as to provide for a predetermined vibration damping of the load.

4,603,844
CUSHION ISOLATOR

Thomas Chen, No. 6, Lane 164, Yuan Da Rd., Sec. 1, Yuanlin Chunghwa, Taiwan

Filed Oct. 30, 1984, Ser. No. 666,545
Int. Cl.[4] F16F *9/04*
U.S. Cl. 267—118 6 Claims

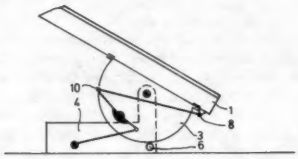


1. A cushion isolator comprising:
(a) a base body;
(b) a supporting plate;
(c) a hollow, flexible drum having upper and lower flanges disposed between the base body and the supporting plate;
(d) first means to attach the lower flange to the base body;
(e) second means to attach the upper flange to the supporting plate;
(f) a passage defined by the supporting plate and communicating between an exterior surface of the supporting plate and an interior space within the hollow, flexible drum;
(g) valve means connected to the passage to control the flow of a pressurized gas into the interior of the hollow, flexible drum;
(h) a hollow guide sleeve attached to the base body and extending into the interior of the hollow, flexible drum;
(i) a cushion of flexible material disposed on the base body within the hollow guide sleeve;
(j) a cylindrical member attached to the supporting plate and extending into the interior of the hollow, flexible drum in alignment with the hollow guide sleeve, a distal end of the cylindrical member being slidably received in the hollow guide sleeve such that, during extreme compression of the hollow flexible drum, the distal end of the cylindrical member contacts the cushion of flexible material; and,
(k) pressure gauge means to indicate the pressure of the gas in the interior of the hollow, flexible drum.

4,603,845
X-RAY UNIT WHICH CAN BE SWIVELLED ABOUT A HORIZONTAL AXIS

Walter Schmedemann, Tangstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1984, Ser. No. 596,783
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 3313994
Int. Cl.[4] H01J *37/20*
U.S. Cl. 269—323 4 Claims

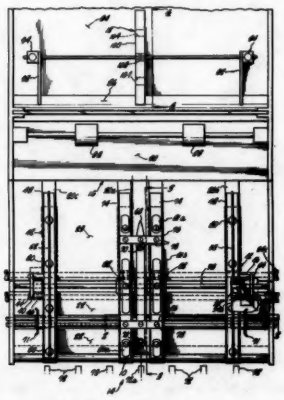


1. An examination table comprising:
a pedestal having a horizontal axis;
a guide pivotably mounted on the pedestal to be swiveled about the horizontal axis;
a table top supporting frame having a longitudinal direction transverse to the horizontal axis, said frame being slidably mounted on the guide for sliding in the longitudinal direction; and
a lever arrangement for linking the swivel motion of the guide to the longitudinal motion of the table top supporting frame;
characterized in that the lever arrangement comprises:
a two-arm lever pivotably mounted on the guide at a bearing spaced from the horizontal swivel axis, said two-arm lever having first and second opposite ends;
a first rod having first and second opposite ends, the first end being pivotably connected to the first end of the two-arm lever, the second end being pivotably connected to the pedestal; and
a second rod having first and second opposite ends, the first end being pivotably connected to the table top supporting frame, the second end being pivotably connected to the second end of the two-arm lever.

4,603,846
DUAL-STREAM ENVELOPE FEEDER

Kevin Miles, Rncho. Cucamga, Calif., assignor to Micheal Miles; Alfred Dubler; Rick Diebold and David Dubler, all of Ontario, Calif.

Filed Oct. 3, 1984, Ser. No. 657,373
Int. Cl.⁴ B65H *9/04*
U.S. Cl. 271—2 **11 Claims**



1. A dual-stream feeder for a sheet feeding printing press, the press having a conveyor section receiving separate sheets from stack feeding means and opposed reciprocating jogging means at opposite sides of the conveyor section for lateral movement of the sheets from opposite sides toward a register path over a register board on the conveyor section, the feeder comprising:

(a) register means for defining a laterally fixed spacing between two streams of the sheets, the register means comprising an elongated member having opposite parallel sides separated by the fixed spacing; and

(b) means for fastening the register means to the register board between the joggers,

wherein the jogging means can move corresponding sheets laterally into contact with the sides of the register means, positioning the sheets in lateral registration at the fixed spacing.

4,603,847
BANK NOTE PROCESSING MACHINE EQUIPPED WITH A CASSETTE FOR ACCOMMODATING BANK NOTES

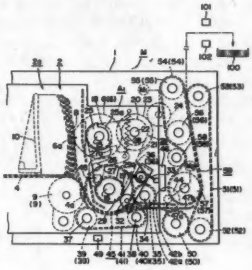
Koichi Oota, and Tsuguo Mizoro, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jun. 13, 1984, Ser. No. 620,209
Claims priority, application Japan, Jun. 20, 1983, 58-93339[U]
Int. Cl.⁴ B65H *1/02*
U.S. Cl. 271—10 **5 Claims**

1. A bank note processing machine in which at least one cassette for accommodating bank notes is detachably loaded, the foremost one of the bank notes in the cassette being fed out one by one by feeding means provided in the cassette, the fed out band note being thereafter conveyed by bank note conveying means to the outlet of the machine, which comprises:

(a) at least one cassette having therein a bank note accommodating portion, at least one feed roller, having a dispensing portion in an angular range about its axis, gate means for forming a gate gap for permitting one bank note to pass therethrough, a first bank note conveying means for receiving a bank note having passed through the gate gap to convey to a second bank note conveying means formed in the main body of the machine, a first driven rotary means to which a driving force is transmitted from the main body of the machine to rotate the feed roller and the gate means, a second driven rotary means to which a driving force is transmitted from the main body thereof to drive the first bank note conveying means, and lock means for locking the feed roller responsive to the cassette being detached from the main body of the machine;

(b) first rotary drive means provided on the main body thereof and connected with the first rotary driven means when the cassette is loaded in the main body thereof;



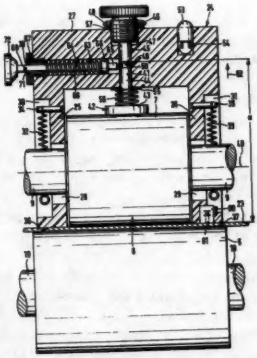
(c) second rotary drive means provided on the main body thereof, connected with the second driven rotary means when the cassette is loaded in the main body thereof and controlled independently of the first rotary drive means; and

(d) lock release means for releasing the lock means in order to permitting the feed roller to rotate when the cassette is loaded in position in the main body thereof.

4,603,848
SHEET SEPARATOR INCLUDING PASSAGE GAP ADJUSTING MECHANISM FOR SEPARATING SHEETS OF VARIOUS THICKNESSES FROM A STACK OF SHEETS

Wilhelm Markgraf, Tennenbronn; Werner Lehmann, Gutach, and Rainer Fecker, Furtwangen, all of Fed. Rep. of Germany, assignors to Mathias Bäuerle GmbH, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,881
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412574
Int. Cl.⁴ B65H *3/52*
U.S. Cl. 271—125 **18 Claims**



1. A sheet separator for a sheet feeder, comprising: a friction cylinder; drive means for rotating said friction cylinder; a

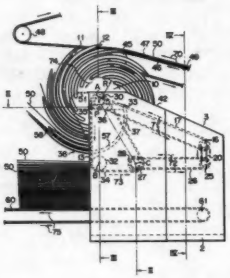
retaining member mounted for radial movement relative to said friction cylinder and provided with a braking surface having a high coefficient of friction and forming with said friction cylinder a passage gap which is adjustable to the thickness of a sheet to be separated; a carrier connected to and supporting said retaining member; gap adjustment means connected to said carrier and said retaining member for adjusting a width of the passage gap; a bracket mounted on said carrier and movable radially relative to said friction cylinder, said bracket having a contact surface which can be applied in said passage gap against said friction cylinder; a checking element movably mounted to said bracket and engaged with said retaining member; a signal switch associated with said checking element for changing its switching state at a selected position of said retaining member relative to said contact surface; and a switching circuit connected to the signal switch for indicating its change in switching state.

4,603,849

PAPER-SHEET DIVIDING APPARATUS

Kunihiko Nakamura, and Takashi Koshiyouji, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 24, 1983, Ser. No. 526,137
Claims priority, application Japan, Sep. 3, 1982, 57-152552
Int. Cl.[4] B65H *29/40, 31/32, 33/16*
U.S. Cl. 271—186 **16 Claims**



1. A paper-sheet dividing apparatus comprising:

(a) a blade wheel including a rotating shaft and a plurality of first blades each having a paper-sheet receiving surface and extending outwardly from a peripheral vicinity of the rotating shaft;

(b) inserting means for putting each of the paper sheets into a space formed between two adjacent first blades;

(c) means for discharging the paper sheets from the spaces;

(d) stacking means for piling the paper sheets discharged from the spaces;

(e) a second blade having a paper-sheet supporting surface of the same shape as that of the paper-sheet receiving surfaces of the first blades;

(f) supporting means for rotatably supporting the second blade which is substantially coaxial with the first blades at a stop position; and

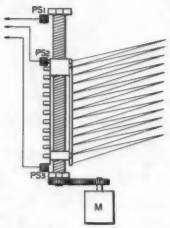
(g) a further means for rotating the second blade at the same rotating speed as that of the first blades from the stop position to a discharging position and thereafter moving the second blade away from the rotating shaft of the blade wheel.

4,603,850

CONTROLLING METHOD FOR A SORTER

Tatumi Horiuchi, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1982, Ser. No. 435,615
Claims priority, application Japan, Oct. 28, 1981, 56-173353
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—288 **4 Claims**



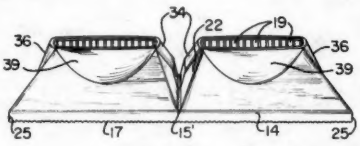
1. In a copying machine with a reciprocal sorter having movable bins capable of collating in upward and downward directions through a number of bins corresponding to a selected number of copies set for copying originals, the improvement comprising a detecting means for generating a signal in response to a change of the number of copies during the collating operation and an automatic means for returning the movable bins to a specific standard position in response to the signal.

4,603,851

PORTABLE EXERCISING DEVICE

Brian Russell, 11715 Keough Dr., Northglenn, Colo. 80233

Filed Jul. 22, 1985, Ser. No. 757,299
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—96 **14 Claims**



1. A portable, self-contained unit adapted for in-place exercising and strenthening the lower extremeities of the human body, comprising:

a pair of pad members each composed of a resilient, compressible material;

common base means composed of resilient compressible material uniting said pad members in juxtaposed relation to one another whereby to define a common groove between said pad members, said pad members and said base being of unitary construction and said compressible material being of substantially uniform density throughout said pad members and said base;

each said pad member having an upper foot-engaging surface integral with each said pad member, each said pad member being generally rectangular in horizontal cross-section and having downwardly divergent side and end walls extending continuously from said upper foot-engaging surface to said common base, said side and end walls interrupted by generally convex bulge portions extending the substantial length of each of said sidewalls and end walls, said convex portions being integral with said pad members and sloping downwardly from said upper foot-engaging surface, whereby said bulges improve the lateral

stability of the pad members in response to lateral deflection imparted to said pad members.

4,603,852

MAT FOR SPORTS AND ATHLETICS

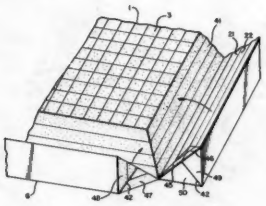
Hans-Ulrich Breitscheidel, Siegburg, and Rudolf Kautz, Hennef, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 4, 1983, Ser. No. 538,785

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236633

Int. Cl.[4] A63B *5/02;* **B32B** *3/26*

U.S. Cl. 272—109 **20 Claims**



1. A mat for sports and athletics which comprises a core layer made of an elastic foam material provided on the topside with a skin-compatible top material and on the underside with a skidproof layer, the core layer having side rims extending from the top side to the underside which are continuously beveled, and the top material being provided with projecting border portions having a width corresponding to twice the thickness of the mat and projecting beyond the topside of the core layer; on the inside of the projecting border portion two equal-sized, wedge-like ridges for forming the lateral border are arranged side-by-side and bonded to the projecting border portion and extend in parallel to the side of the mat, said ridges having the cross-section of an isosceles right triangle, a height corresponding to half the thickness of the mat and being made of an elastic foam material; and the projecting border portions of the top material being extended with the ridges over the surfaces of the side rims to the underside of the mat, and the resulting joint gaps are sealed whereby the lateral border is produced along the periphery of the mat.

4,603,853

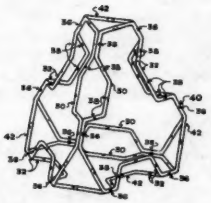
MODULAR FRAME STRUCTURE AND BUILDING SYSTEM

Edward W. Satterthwaite, 2107 Spruce St., Philadelphia, Pa. 19103

Filed Aug. 26, 1983, Ser. No. 526,643

Int. Cl.[4] A63B *9/00*

U.S. Cl. 272—113 **14 Claims**



1. A system of interconnectable building modules, each module comprising:

a triangular wall element having a base leg and two standing legs, the legs each defining a longitudinal axis, and the wall element defining a plane, the base leg and the standing legs being elongated members joinable at their ends to one another in an isosceles triangle having an angle of about fifty-five degrees between the longitudinal axis of said base leg and the longitudinal axes of each said standing leg and having an angle of about seventy degrees between the longitudinal axes of said two standing legs, the standing legs each having a connection hole oriented perpendicular to the respective longitudinal axes of the standing legs and oriented at 60 degrees to a plane defined by said isosceles triangle, and the base leg having a connection hole oriented perpendicular to the longitudinal axis of said base leg and oriented at forty-five degrees to said plane of said triangle, four said triangular wall elements forming a substantially tetrahedral building module when connected using coextensive connection holes, the four triangular wall elements being connected in a tetrahedron, said four wall elements defining a base plane, two sloping planes and a fourth plane perpendicular to said base plane, said elements, attached to one another along coextensive base legs, said base legs and said standing legs each further having at least one facewise-connecting hole oriented perpendicular to the respective longitudinal axis of said legs and perpendicular to the plane of said triangular element, whereby the triangular element is connectable in register directly to an additional triangular element placed thereupon, and whereby the tetrahedral building module can be attached to other tetrahedral building modules to form structures.

4,603,854

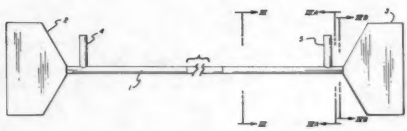
TRUNK-TWIST EXERCISE DEVICE

Frank Krausz, 405 Commonwealth Ave., Boston, Mass. 02215

Filed Jun. 7, 1984, Ser. No. 618,187

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—116 **7 Claims**



1. A trunk-twist exercise device which consists of a shaft having blades mounted at either end thereof and two handles attached to said shaft, each handle being closer to the end of said shaft than its mid point and being mounted with its axis perpendicular to the axis of the shaft, wherein the angle between the axis of the handles and the plane of the blades is adjustable.

4,603,855

VARIABLE EXERCISE APPARATUS

Leslie W. Sebelle, P.O. Box 1661, Honolulu, Hi. 96806

Filed Jan. 2, 1981, Ser. No. 222,164

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—117 **34 Claims**

1. An exercise apparatus comprising

a frame having a pair of spaced upright stanchions,

a carriage supported by each of said stanchions for substantially vertical positioning,

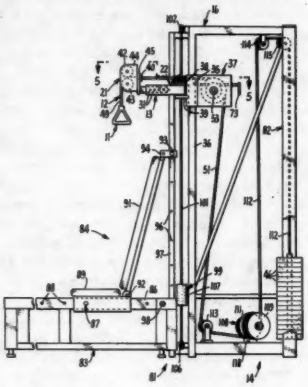
a telescoping arm carried on each of said carriages for movement therewith and having an end pivotably secured thereto,

a cable running along each of said arms,

pulley means on said arms supporting said cables for longitudinal movement relative to said arms,

a manually engageable handle on the end of each of said

cables adjacent to the distal end of the associated one of said arms,

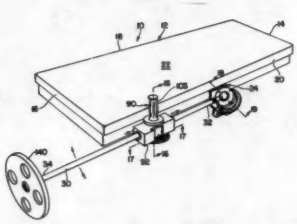


and weight means on the other end of said cables for resisting pulling of said cables toward said distal end of said arms.

4,603,856
EXERCISING DEVICE

Russell D. Fiore, 9 Raymond St., Lincoln, R.I. 02865

Filed Oct. 2, 1984, Ser. No. 656,958
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—131 **20 Claims**

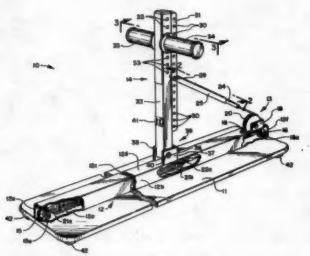


1. An upper extremity exercising device for use with a support for a human exerciser including a substantially planar surface for supporting one of the shoulders of the exerciser and defining a lateral plane, said exercise device comprising a rigid elongated member having upper and lower ends, means for operatively connecting said lower end with said support at a position substantially laterally adjacent said planar surface exerciser, means comprising a lower resistance unit for pivotally supporting said lower end such that said member may simultaneously transcribe arcs of substantially 180 degrees in planes substantially parallel and normal to said lateral plane, said supporting means further including means for adjusting the resistance to pivotal movement of said member such that both the human effort needed to transcribe such arcs can be progressively increased or decreased dependent on exercise requirements and the position of said member may be alternatively fixed with respect to said support, and an upper resistance unit including a handle assembly for grasping by the exerciser and supported for longitudinally slidable movement on said member intermediate the upper and lower ends thereof, said handle assembly being adapted for said slidable movement while said member simultaneously pivotally moves with respect to said support, said handle unit having means for adjusting the resistance to sliding movement on said member such that the human effort needed to move said unit can be progressively increased or decreased dependent on exercise requirements and the position of said unit may be alternatively fixed with respect to said member.

4,603,857
SPRING EXERCISE DEVICE

Max C. Chipman, 1938 N. 275 West, Orem, Utah 84101, and George R. Horton, 1340 E. 130 North, Springville, Utah 84663

Filed Feb. 10, 1984, Ser. No. 578,850
Int. Cl.[4] A63B *21/04*
U.S. Cl. 272—136 **8 Claims**



1. An exercise device comprising
a base;
a spring housing extending centrally across the base, whereby portions of the base extend outwardly from opposite sides of the housing;
a spring in the housing having one end thereof fixed to the base at one end of the housing;
a pulley carried by an opposite end of the housing and rotatable into the housing
a pivot arm having one end thereof pivotally mounted to the housing intermediate the ends thereof;
a cable having one end fixed to the other end of the spring, in the housing passed around the pulley, and its other end connected to the pivot arm intermediate the length thereof; and
handle means connected to and projecting from the pivot arm.

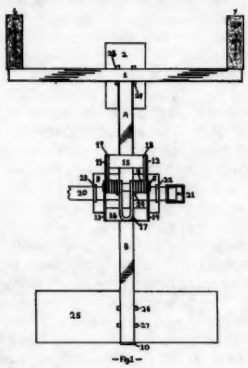
4,603,858
ABDOMINAL EXERCISER

Edward J. Reehil, 215 5th Ave., Bradley Beach, N.J. 07720

Filed Nov. 5, 1984, Ser. No. 668,413
Int. Cl.[4] A63B *23/02*
U.S. Cl. 272—137 **6 Claims**

1. An abdominal exercise device comprising two oppositely extending elongated structural member means; the opposing ends of said structural member means being pivotally joined to pivotal resistance means tending to pivot and hold said elongated structural member means in substantially the same plane; the free ends of said elongated structural member means each having a body contact member means attached thereto, with a third body contact member means attached to one of the elongated structural member means adjacent the pivotal resistance means and overlying the opposed ends with all said body contact member means lying in substantially the same plane; said third body contact member means having means for fastening said third body contact member means to the waist of an operator whereby, with the third body contact member means at the abdomen of the operator and the other two body contact

member means at the chest and thighs respectively, the operator can do abdominal exercises, sit-ups, and leg lifts by pivoting



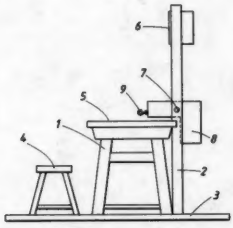
the elongated structural member means against the opposition of the pivotal resistance means.

4,603,859

IMPLEMENT FOR HEAVY ATHLETICS

Matthias Schnaitl, Gundertshausen 9, A- 5142 Eggelsberg, Austria

Filed Oct. 4, 1984, Ser. No. 657,782
Claims priority, application Austria, Oct. 6, 1983, 3542/83
Int. Cl.[4] A63B *21/04*
U.S. Cl. 272—142 **7 Claims**



1. An athletic training and competitive implement which comprises:

a frame;

a housing mounted on said frame;

a rigid elongated tensile element guided in said housing for linear displacement in a given direction parallel to a longitudinal dimension of said tensile element and having one end located externally of said housing and another end disposed internally of said housing;

means for pivotally mounting said housing on said frame for tilting movement about an axis perpendicular to said direction;

means on said one end of said tensile element for enabling same to be tractively displaced by a trainee or a competitor;

a tension-restoring spring in said housing engaging said other end of said tensile element and stretched upon longitudinal extension of said tensile element from said housing in said direction;

an electronic force-measuring sensor in said housing for generating an output signal representing tensile force;

a digital display device electronically connected to said force-measuring sensor for displaying a value of said output signal;

means continuously connecting said spring to said sensor to exert on said sensor a force which, in accordance with a predetermined characteristic, depends continuously on the movement of said one end and thereby enabling said display to continuously depict tensile force generated in said spring and applied to said tensile element; and

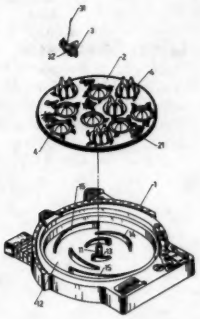
damping means operatively connected to said tensile elements and extending along said spring for braking movement of said tensile element in a direction opposite to the direction of said tensile force.

4,603,860

TOY OF HONEY-GATHERING BEE

Shinn-Hsiung Wey, No. 223, Yeong Fu Road, Tainan, Taiwan

Filed May 7, 1985, Ser. No. 731,463
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—1 GD **3 Claims**



1. A kind of toy of honey-gathering bee including, a stationary pan on which at least a pair of rails with their surfaces rising up and down in the same direction are set; in said each rail is bored a ditch on whose outside wall is cut vertical convex stripes; in the higher part of said each rail is burried a permanent magnet possessing a different polarity for the same pair of rails;

a turning plate, to be placed on said stationary pan, including

a plurality of cavities, bored in said plate itself, located along the ways of said rails, which have a wider upper part than the lower part and a notch cut in the bottom and wall in order to pass on said rails;

a flower in each cavity which will open (or blossom) or close up according to the high or low surface of said rail; and

a magnetic pistil, placed inside said flower, which will turn over if its underside polarity is the same as that of the magnet in said rails when said flower is passing on said magnet of said rails; and

a honey-gathering bee with a permanent magnet hidden in its abdomen, fastened to a fishing rod with a string and used for angling up said magnetic pistil while said petals of said flower are opened widely.

4,603,861

BOWLING BALL

Walter Arnott, 720 Carrollwood Village, #305, Gretna, La. 70053

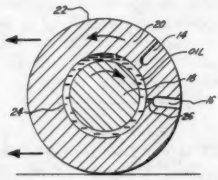
Filed Sep. 17, 1984, Ser. No. 650,882
Int. Cl.[4] A63B *37/00, 37/08*
U.S. Cl. 273—63 R **8 Claims**

1. A bowling ball comprising:

a homogeneous non-hollow solid core in the shape of a sphere;

a mantle in the shape of a sphere having an inner surface

surrounding said core and generally concentric with said core and presenting a substantially spherical surface on which said ball rolls; and



a layer of lubricant between said core and mantle for facilitating independent rotation of said core and mantle.

4,603,862

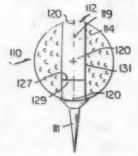
GOLF BALL WITH ALIGNMENT MARKER

Richard M. Chen, 51-25 Goldsmith St., Elmhurst, N.Y. 11373

Division of Ser. No. 321,572, Nov. 16, 1981, Pat. No. 4,432,551, which is a continuation-in-part of Ser. No. 282,054, Jul. 10, 1981, Pat. No. 4,441,716. This application Feb. 17, 1984, Ser. No. 581,231

Int. Cl.⁴ A63B *69/36*

U.S. Cl. 273—183 C **12 Claims**



1. A golf alignment marking device comprising: in combination, a marking member and a conventionally sized golf ball, said marking member being formed with an adhesive on a first surface and being formed with an impact mark forming material on the second surface, said member comprising a center line on the second surface, said member being adhesively applied to the surface of said golf ball so that the centerline is coincident with the circumference of the golf ball, whereby when the golf ball and marking member combination is aligned on a tee with the center line aligned at the back, and the golf ball and member combination is impacted by a golf club face, an impact mark is produced in relation to the centerline, so that ball flight deviation from the centerline is determined in reading the impact mark relationship to the centerline.

4,603,863

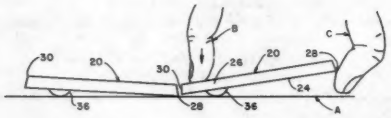
TILTABLE GAME PIECES FOR USE WITH BOARD GAMES

William D. Meyer, 2816 Sutton Blvd., Maplewood, Mo. 63143

Filed Dec. 17, 1984, Ser. No. 682,248

Int. Cl.⁴ A63F *3/00*

U.S. Cl. 273—282 **7 Claims**



7. In a game comprising a plurality of playing pieces, each of said playing pieces including an upper portion having an upper surface with a playing indicia thereon and defined by an outer periphery, and supporting means including a playing surface thereon adapted to support said plurality of playing pieces adjacent one another on said playing surface during playing of the game, the improvement comprising fulcrum means on each playing piece opposite from the upper portion, said fulcrum means including less than three spaced projections, each projection being located away from the center of the piece and adjacent said outer periphery such that said projections are in contact with said playing surface when said playing piece is disposed on said playing surface, each projection being spaced inwardly a sufficient distance from the outer periphery and projecting downwardly from the playing piece toward said playing surface so that application of a force directed downwardly against said upper surface adjacent said outer periphery in the area between the outer periphery and at least one of the projections causes said playing piece to pivot about said at least one of the projections thereby causing downward pivoting of said playing piece adjacent to said at least one projection toward said playing surface and causing upward pivoting of said playing piece on the opposite side of said at least one projection to a position facilitating grasping of said playing piece for removal of said playing piece from said playing surface.

4,603,864

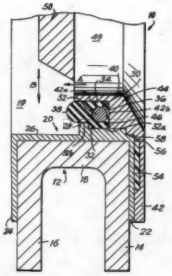
SEALING ARRANGEMENT FOR KNIFE GATE VALVES

George S. Raftis, Pittsburgh, Pa., assignor to Red Valve Company, Inc., Carnegie, Pa.

Filed Jun. 14, 1985, Ser. No. 744,692

Int. Cl.⁴ F16J *15/12*; F16K *3/22*

U.S. Cl. 277—12 **4 Claims**



1. In a knife gate valve for controlling the flow of a pressurized medium along a path, a sealing arrangement comprising:

(a) a valve body having an internal flow-through passage which extends along an axis;

(b) a liner having upstream and downstream annular flange portions and an annular liner portion located between the flange portions, all of the liner portions engaging and being mounted on the valve body, said liner portion circumferentially bounding, at least in part, the passage and having an annular stop extending radially inwardly into the passage;

(c) an annular seat of sealing material and having a generally L-shaped cross-section, said seat having an outer stepped surface mounted on and sealingly engaging the stop and the liner portion, an inner surface located radially inwardly of the outer stepped surface, an upstream surface located upstream of the stop, and a downstream sealing surface located downstream of the stop;

(d) a retainer ring having an annular upstream flange engaging the upstream flange portion of the liner, and a retaining portion having an axially-extending surface sealingly engaging the inner surface of the seat and a radially-

extending surface sealingly engaging the upstream surface of the seat, said retaining portion and said liner bounding a cavity in which the seat is securely retained against removal during the flow of the medium, said retaining portion bounding an internal flow-through section extending along the axis; and

(e) a knife gate mounted on the body intermediate the flow-through passage and the flow-through section for movement between a fully-open position in which the gate is remote from the seat, and a fully-closed position in which the gate sealingly engages the sealing surface of the seat.

4,603,865

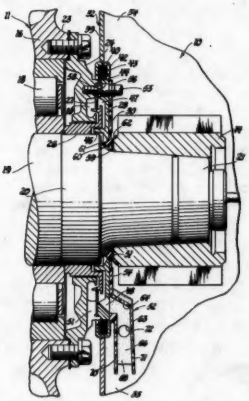
DRIVE MOTOR GEAR LUBRICANT SEAL FOR LOCOMOTIVES AND THE LIKE

Paul R. Bien, Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1985, Ser. No. 704,758

Int. Cl.[4] F16J *15/34, 15/447;* **F16H** *57/02*

U.S. Cl. 277—12 **6 Claims**



1. A unitary seal in combination with a motor and drive gear system having a motor frame with attached gear case enclosing a pair of engaged drive gears and containing lubricant for lubrication of the gears, the motor having a shaft opening and a surrounding seal plate open to the gear case interior and through which extends a motor shaft carrying one of said gears spaced adjacent said seal plate, said seal plate including at least one inner drain opening below the shaft opening and communicating directly with the gear case interior to return lubricant passing through the shaft opening to the gear case, said inner drain opening being connected internally through a labyrinth seal with external drain openings outside the gear case to exhaust lubricant passing the labyrinth seal,

said unitary seal comprising

a flat body mountable on the seal plate within the gear case and having an opening for the motor shaft, said body extending into close radial spacing with said shaft,

locating means in said body for locating said body on said seal plate, around said motor shaft opening,

a flexible annular sealing lip around said seal opening on a front side of said body and extending outward into close relation with the adjacent end of the shaft-carried gear to limit the flow of lubricant from the gear case into the motor opening, and

means defining an enclosed duct depending from the bottom and front side of said body within the gear case, said duct including a drain opening through the back of said body and aligned with said seal plate inner drain opening and an opening at the bottom of said duct communicating with said gear case interior, said duct permitting the discharge of lubricant from the seal plate drain opening to the gear case interior while tending to block the flow of lubricant thrown or forced up by rotation of the gears from entering the seal plate drain opening and being forced through the labyrinth seal to the external drain, thereby reducing the loss of lubricant from the gear case during operation.

4,603,866

SHAFT AND RADIALLY-SEALING RING WITH COLD FLEXED SEAL DISK

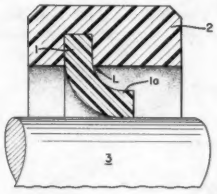
Dieter Fuchs, Riedstadt, and Wolfgang Schmitt, Viernheim, both of Fed. Rep. of Germany, assignors to H. Weissenfeld-Richters, Weinheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 775,470, Sep. 12, 1985. This application Dec. 20, 1985, Ser. No. 811,896

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501065

Int. Cl.[4] F16J *15/32*

U.S. Cl. 277—152 **16 Claims**



1. A shaft and seal ring combination made by the process comprising:

providing the shaft;

cold flexing the inside of an annular, planar disk of non-elastomeric plastic about the shaft, the disk having a thickness of form about 0.8 to about 2 mm and, before being cold flexed about the shaft, an inside diameter of from about 1 to about 6 times the thickness of the disk less than the diameter of the shaft; and

sealingly attaching a stiffening ring about the outside of the disk, the line of the innermost sealing attachment between the stiffening ring and the disk being from about 1.1 to about 4 times the thickness of the disk from the surface of the shaft.

4,603,867

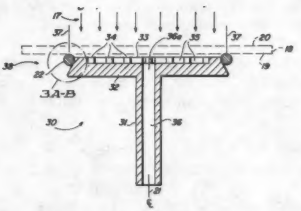
SPINNER CHUCK

Richard R. Babb, Apache Jct., and Howard A. Kirschler, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1984, Ser. No. 596,207

Int. Cl.[4] B23B *31/30*

U.S. Cl. 279—3 **16 Claims**



8. A method for spinning a wafer comprising:

providing a wafer chuck having a peripheral seal holding groove with a conical skirt below said groove;

providing in said groove a moveable circular seal for con-

tacting and sealing against said wafer and said wafer chuck, wherein a portion of said seal protrudes from a first surface of said chuck;

placing a wafer on said seal above said first surface;

applying a pressing force to said wafer in a direction toward said first surface;

moving said seal, in contact with said wafer and said wafer chuck, downwards over said conical skirt without substantially crushing said seal while simultaneously radially stretching said seal to provide an opposing force for sealing and for automatically restoring said seal to its position prior to said applying step after spinning is stopped; and

spinning said chuck and said wafer.

4,603,868

ROLLER SKATE UNDERCARRIAGE WITH ADJUSTABLE ROLLERS

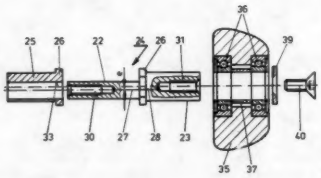
Ernst Schütz, Adlikerstrasse 79, CH-8105 Regensdorf, Switzerland

Filed Aug. 18, 1983, Ser. No. 524,244

Claims priority, application Switzerland, Apr. 25, 1983, 2210/83

Int. Cl.[4] A63C *17/18*

U.S. Cl. 280—7.13 **6 Claims**



1. A roller skate undercarriage for being attached to a skate which includes an upper structure, the undercarriage comprising:

a roller carriage including means for supporting skate rollers thereon; and attachment means for detachably fastening the carrier to the upper structure of the skate;

the means for supporting rollers comprising holes in the carrier each for receiving a roller axle, and roller axles being received in the holes in the carrier; rollers being carried on the roller axles;

the roller skate undercarriage further comprising a hub supported on the axle outward of the carrier; a respective one of the rollers being received on the hub; the hub having an axis which is parallel to and offset from the axis of the axle, such that rotative adjustment of the hub with respect to the axle adjusts the height of the roller supported on the hub with respect to the carrier;

a pair of hubs for each axle, the hubs of the pair being located on the opposite sides of the carrier; each hub carrying a respective one of the rollers on it;

one of the hubs of a pair thereof on an axle being rotatably adjustable with respect to the axle independently of the other hub, whereby each roller of a pair thereof is individually adjustable in height with respect to the carrier.

4,603,869

HELICOPTER GROUND HANDLING WHEEL ASSEMBLY

Eugene O. Maxwell, 120 Coin, Fort Worth, Tex. 76140

Filed Nov. 13, 1984, Ser. No. 670,567

Int. Cl.[4] B64F *1/04*

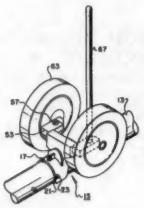
U.S. Cl. 280—11 **3 Claims**

1. In a ground handling wheel assembly for coupling to a skid of a helicopter, each of the skids having locking pins protruding laterally outward from opposite sides, an improved means for securing the wheel assembly to the skid, comprising in combination:

a cradle having a downwardly facing channel for reception over the skid and having a slot on each side for receiving one of the locking pins;

a pivot pin extending across the top of the cradle parallel with the axis of the channel;

a cam mounted to the pivot pin for rotation therewith, and extending through an aperture in the top of the cradle for engaging the top of the skid;



an arm coupled to the pivot pin and extending laterally outward for selectively rotating the pivot pin and thereby the cam to an overcenter stop position wedging against the top of the skid; and

a knob coupled to the arm, the knob having a stop surface that contacts the cradle to locate the cam in the desired overcenter stop position, the knob being positionable along the length of the arm to selected positions, each of which varies the angle of the arm with respect to the cradle when the stop surface engages the cradle, thereby varying the desired overcenter position to accommodate variations in skid diameters.

4,603,870

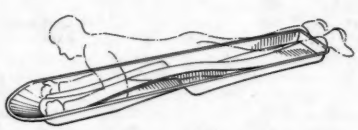
KNEELING OR SITTING SLED

F. Javier Monreal, 4242 Barker Hill Rd., Jamesville, N.Y. 13078

Continuation-in-part of Ser. No. 615,116, May 30, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 751,599

Int. Cl.[4] B62B *13/04*

U.S. Cl. 280—18 **1 Claim**



1. A recreational lightweight snow sled comprising an elongated body molded from a single piece of plastic sheeting material and being four to five feet in length, fifteen to twenty four inches in width, and four to five inches in height, said sled having a bottom portion, a pair of longitudinally extending parallel side portions, a rear portion interconnecting the aft ends of said side portions, and a front portion interconnecting the front ends of said side portions, said front portion having a forwardly extending contoured shape, said bottom portion having a longitudinally extending middle section and a longitudinally extending lateral section along each side of said middle section, said middle section being eight to ten inches wide at each end and tapering to a width of four to six inches at its midpoint, said middle section being progressively curved upwardly from a lowest point at each end to a raised hump at its midpoint, said hump extending three to five inches above the bottom surface of the sled, each said lateral section being four to six inches wide at its midpoint and tapering to a width of

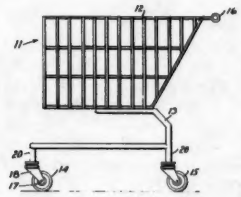
three to four inches at each end, each said lateral section being progressively curved upwardly from its front end to its midpoint while remaining below the height of said middle section, and a knee pocket in the form of a curved depression located directly behind the midpoint of each lateral section and extending three to five inches below the highest point of said lateral section, said lateral section rising progreessively upwardly from said knee pocket to the rear end of said lateral section while remaining below the height of said middle section, wherein said sled may accommodate a user while in a sitting position, a kneeling position, or a prone position.

4,603,871

WHEEL FOR SHOPPING CART OR THE LIKE

Samuel J. McNeill, Redondo Beach, Calif., assignor to Fred N. Schwend, Mira Loma, Calif., a part interest

Continuation-in-part of Ser. No. 740,756, Jun. 3, 1985, abandoned. This application Jul. 26, 1985, Ser. No. 760,758
Int. Cl.[4] B62B *39/00*
U.S. Cl. 280—33.99 C **12 Claims**



1. A wheel for restraining free rolling movement of a shopping cart or the like from a parked position, said wheel comprising

bearing means for mounting said wheel on said cart or the like for rotation about an axis,

means on said wheel forming a cavity surrounding said bearing means,

said cavity extending concentrically about said axis,

flowable weighting material in said cavity,

said material being effective to flow under the influence of gravity to the bottom of said cavity,

said material only partially filling said cavity, and

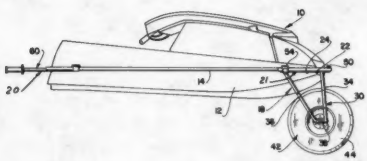
projections on said wheel extending into said cavity and into the path of movement of said material whereby to restrain rolling movement of said wheel.

4,603,872

JET-SKI DOLLY

Peder S. White, 345 University Dr., L2, Costa Mesa, Calif. 92626

Filed May 8, 1985, Ser. No. 731,870
Int. Cl.[4] B62B *1/20*
U.S. Cl. 280—47.13 B **4 Claims**



1. A dolly apparatus arranged to be removably mounted to a jet-ski vehicle having a peripheral overhang for the transporting thereof, comprising:

a framework adapted to be removably attached to the bow of said jet-ski vehicle;

means mounted on said framework for removably attaching said framework to said bow;

at least one wheel rotatably mounted to said framework;

handle means arranged to be removably mounted adjacent the rear of said jet-ski vehicle;

removable mounting means affixed to said handle means for removably mounting said handle means to said jet-ski vehicle;

said framework comprising:

a carriage bar formed to fit the configuration of said bow of said jet-ski vehicle; and

wheel-support struts fixedly secured to said carriage bar, and arranged to receive and support said wheel therebetween;

and wherein said removable attaching means comprises:

a nose stud mounted to said carriage bar and positioned to engage said peripheral overhang disposed about said jet-ski vehicle; and

a pair of hook members fixedly secured to said carriage bar, and formed to engage said peripheral overhang;

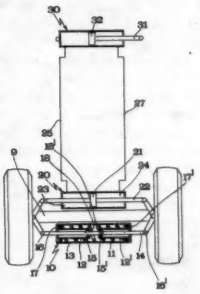
wherein said handle means comprises a pair of elongated handlebars, said removable mounting means being mounted on each of said handlebars, and each of said removable mounting means comprises a hook member mounted adjacent one end of said handlebar for locking engagement with said overhang and a latching tongue positioned adjacent the opposite end of said handlebar for engagement with said overhang when upward force is applied to said handlebar.

4,603,873

DEVICE FOR STRAIGHT TRAVELING STABILIZATION AND CHANGE OF ATTITUDE ON PREDETERMINED PATHS FOR VEHICLE AXLES

Roberto Perlini, Corso Venezia 93, S. Bonifacio, Italy

Continuation of Ser. No. 391,184, Jun. 23, 1982, abandoned. This application Aug. 21, 1985, Ser. No. 767,698
Claims priority, application Italy, Nov. 5, 1981, 68427 A/81
Int. Cl.[4] B62D *13/00*
U.S. Cl. 280—94 **6 Claims**



1. A device for straight traveling stabilization and modification of attitude on predetermined paths for vehicle axles, comprising a permanent elastic energy loading unit connected to an axle and exerting a force on steerable wheels supported by said axle, a shifting actuator connected to the axle and operative, when actuated, to exert on said steerable wheels supported by said axle forces of greater intensity than the force exerted by said permanent elastic energy loading unit and a control member for said shifting actuator, responsive to variations in the traveling attitude of the main steering system of the vehicle, characterized in that said permanent elastic energy loading unit and said shifting actuator are mounted on said axle to act directly on said steerable wheels supported by said axle, said

permanent elastic energy loading unit is operative to exert on said steerable wheels supported by said axle a stabilizing force greater than external forces acting on said wheels and said control member is constituted by a hydraulic cylinder hydraulically connected to said shifting actuator by means of two fluid lines which establish a direct communication between said control member and said shifting actuator, said hydraulic cylinder being connected to the main steering system of the vehicle whereby fluid pressure in said hydraulic cylinder is generated by said variations in the traveling attitude of the main steering system and the amount of steering of said steerable wheels supported by the axle is controlled by and graduated in conformity with the amount of steering of said main steering system.

4,603,874

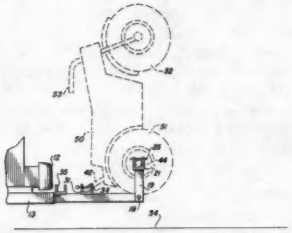
HITCH-BORNE VEHICLE TRANSPORT

Darrell L. Merrill, 18428 N. 32 Dr., Phoenix, Ariz. 85023

Filed Jul. 17, 1985, Ser. No. 755,852

Int. Cl.[4] B60R *9/10*

U.S. Cl. 280—402 **19 Claims**



1. A hitch-borne vehicle transport for releasably bearing the entire weight of a vehicle upon a box-end trailer hitch receiver, said vehicle having at least one pair of coaxial wheels separated by an axle, said vehicle having a graspable body member in spaced relationship to said axle, said hitch-borne vehicle transport comprising:

cantilever means for supporting said vehicle in spaced relationship to said box-end trailer hitch receiver, said cantilever means having an anterior end and a posterior end, said anterior end releasably capturable within said box-end trailer hitch receiver;

a transverse bar having a first end, a second end and a pivot surface intermediate said first and second ends, said transverse bar pivotingly supported adjacent said pivot surface by said cantilever means adjacent said posterior end, said transverse bar orthogonal said cantilever means, said transverse bar substantially parallel said axle;

a first hoist bar having a clevis end a first junction end, said first hoist bar attached at said first junction end to said first end of said transverse bar, said first hoist bar rotatable about said first junction in a plane parallel said cantilever means;

a second hoist bar having a clevis end and a second junction end, said second hoist bar attached at said second junction end to said second end of said transverse bar, said second hoist bar rotatable about said second junction end in a plane parallel said cantilever means, said second hoist bar parallel said first hoist bar;

first clevis means attached at said clevis end of said first hoist bar for releasably capturing said axle adjacent a first of said pair of coaxial wheels of said vehicle;

second clevis means attached at said clevis end of said second hoist bar for releasably capturing said axle adjacent a second of said pair of coaxial wheels of said vehicle;

means adjacent said pivot surface for selectedly resisting pivoting of said transverse bar with respect to said cantilever means; and

third clevis means attached to said cantilever means intermediate said anterior and posterior ends for releasably capturing said graspable body member of said vehicle.

4,603,875

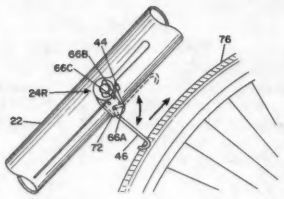
BICYCLE FRONT WHEEL HOLDER

Matthew S. Boughton, Danbury, and Mark T. La Plante, Ridgefield, both of Conn., assignors to Canondale Corporation, Georgetown, Conn.

Filed Aug. 26, 1985, Ser. No. 769,554

Int. Cl.[4] B62H *3/04*

U.S. Cl. 280—272 **12 Claims**



1. A bicycle front wheel holder for holding the front wheel of a bicycle in fixed rotational position relative to the bicycle frame and for keeping the front wheel from turning, comprising:

a wire form member having a first free end and a second free end and a loop in its mid-section spaced-apart from its first and second free ends;

a first bracket member connected to the right shifter boss on the down tube of a bicycle and having means for pivotally receiving the first free end of the wire form member; and

a second bracket member connected to the left shifter boss on the down tube of a bicycle and having means for pivotally receiving the second free end of the wire form member;

said receiving means mounting the wire form member such that it extends away from the down tube and firmly contacts the front wheel to keep it from rotating and turning when the wire form member is in a first pivotal position relative to the bracket members, and extends away from, and is free of contact with, the front wheel when the wire form member is in a second pivotal position relative to the bracket members.

4,603,876

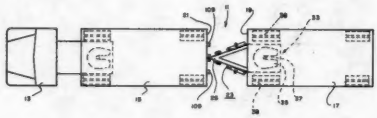
TRAILER CONVERTOR ASSEMBLY

Paul E. Gray, 911 Stratford, West Memphis, Ark. 72301

Filed Dec. 31, 1984, Ser. No. 688,060

Int. Cl.[4] B62D *53/00*

U.S. Cl. 280—474 **9 Claims**



1. A trailer convertor assembly for connecting the front of a trailing trailer to the rear of a leading trailer, the leading trailer including spaced-apart first and second bumpers on the rear thereof, said assembly comprising:

(a) a dolly including a body member having a forwardly projecting tongue for being pivotally attached to the rear of the leading trailer for allowing said dolly to pivot about a generally vertical axis and having a hitch for being

pivotally attached to the front of the trailing trailer, and including wheel means for rollably supporting said body member;

(b) an elongated first strut member having a first end pivotally attached to said body member of said dolly on one side of said vertical axis and having a second end, said first strut member being movable between a first position in which said second end thereof is located remote from the rear of the leading trailer so as not to hinder free pivotal movement of said dolly about said vertical axis and a second position in which said second end thereof is located so as to engage the first bumper of the leading trailer to limit pivotal movement of said dolly about said vertical axis while providing at least a small amount of clearance between the first bumper and said second end of said first strut member when the leading trailer is substantially directly in front of the trailing trailer;

(c) an elongated second strut member having a first end pivotally attached to said body member of said dolly on the other side of said vertical axis from said first strut member and having a second end, said second strut member being movable between a first position in which said second end thereof is located remote from the rear of the leading trailer so as not to hinder free pivotal movement of said dolly about said vertical axis and a second position in which said second end thereof is located so as to engage the second bumper of the leading trailer to limit the pivotal movement of said dolly about said vertical axis while providing at least a small amount of clearance between the second bumper and said second end of said second strut member when the leading trailer is substantially directly in front of the trailing trailer;

(d) a first brace member having a first end pivotally attached to said body member of said dolly and having a second end attached to said first strut member at a point between said first and second ends of said first strut member when said first strut member is in said second position;

(e) a second brace member having a first end pivotally attached to said body member of said dolly and having a second end attached to said second strut member at a point between said first and second ends of said second strut member when said second strut member is in said second position; and

(f) adjustment means for allowing the distance between said second ends of said first and second strut members to be varied for allowing said assembly to be used with leading trailers having bumpers on the rear thereof spaced apart varying distances.

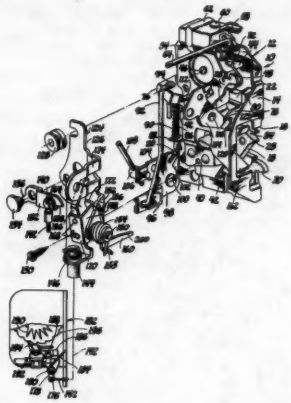
4,603,877

CONTROL MEANS FOR OCCUPANT RESTRAINT BELT SYSTEM

John A. Espinoza, Redford; Jeffrey L. Konchan, Warren, and Ronald P. Rimbey, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1985, Ser. No. 723,438
Int. Cl.[4] B60R *22/34*
U.S. Cl. 280—807 **5 Claims**

1. In combination with a vehicle body closure mounting a restraint belt retractor having disabling means for disabling operation of the retractor, a door latch including a latch bolt releaseable for movement to latched and unlatched positions, inside operating means and outside operating means each operable to effect release of the latch bolt, control means comprising, operating means for actuating the disabling means, latch bolt position sensing means movable to actuating and non-actuating positions, means on the sensing means engageable by the latch bolt during movement of the latch bolt from latched position to unlatched position to move the sensing means to actuating position, connecting means movable to coupling and uncoupling positions with respect to the inside and the outside operating means, the connecting means operably coupling each of the inside and the outside operating means to the operating means in the coupling position thereof and operably uncoupling each of the inside and the outside operating means to the operating means in the uncoupling position thereof, and means actuated by the latch bolt position sensing means when



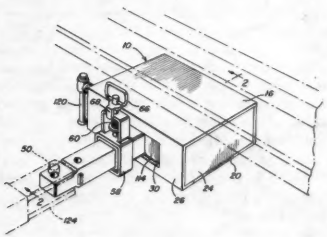
the latch bolt position sensing means is in the actuating position thereof to maintain the connecting means in the uncoupling position and block movement thereof to coupled position.

4,603,878

AUTOMATIC LOCKING AND CENTERING WIDE RANGE TOW HITCH

Hoke Smith, Jr., Rt. 1 Box 247, Americus, Ga. 31709

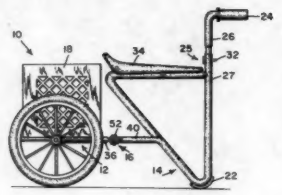
Filed Nov. 20, 1984, Ser. No. 673,771
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—478 A **12 Claims**



1. A wide range tow hitch including a base portion for support from the forward end of a vehicle to be towed or the rear end of a towing vehicle, said hitch including an elongated hitch bar assembly having first and second ends, mounting means mounting said second hitch bar end, intermediate its opposite ends, from said base portion for guided front-to-rear lengthwise extension and retraction relative to said base portion and for angular displacement of said rear hitch bar end about an upstanding axis, shiftable forward and rearward with said hitch bar second end, relative to said base portion between opposite limit positions of angular displacement relative to said base portion, bias means yieldingly biasing said second hitch bar end toward a central position between the front and rear limit positions thereof, first latch means operative to releasably latch said second hitch bar end relative to said base portion in a center position of angular displacement between said opposite limit positions of angular displacement, said first end of said hitch bar assembly being mounted from said second end of said hitch bar assembly for front to rear and oscillatory shifting

therewith relative to said base portion and for front to rear lengthwise guided shifting relative to said second end between forward and rearward limit positions of shifting thereof, and second latch means operative to releasably latch said first end of said hitch bar assembly in said rearward limit position relative to said second end of said hitch bar assembly.

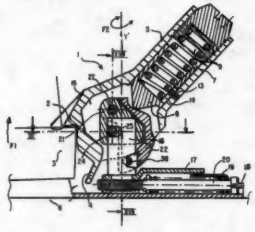
4,603,879
UTILITY CART
Roger J. Morrissette, P.O. Box 1399, Southbridge, Mass. 01550
Filed Jul. 27, 1984, Ser. No. 634,890
Int. Cl.[4] B62B *1/20*
U.S. Cl. 280—652 **3 Claims**



1. Cart comprising:
(a) a first frame portion,
(b) a storage compartment which is supported on the first frame portion,
(c) a pair of wheels which are mounted on the first frame portion on opposite sides of the storage compartment for rotation about a horizontal axis, said wheels forming two support points for said cart,
(d) a second frame portion which is operatively connected to said first frame portion so that said second frame portion lies substantially in a plane which is at a right angle to said axis, said second frame portion having a support foot which forms a third support point for said cart for supporting said cart when it is stationary, said second frame portion is pivotally connected to said first frame portion for movement between and operative position in which said second frame portion is located with said plane to an inoperable position in which said second frame portion lies in a plane which is parallel with said axis and adjacent said storage compartment so that said cart defines a more compact configuration for storage, said pivotal connection including releasable locking means for locking said second frame portion in said operative position,
(e) a handle which is mounted on the second frame portion and which is vertically spaced from said foot for lifting said foot from the ground to enable the cart to be pushed or pulled on said wheels, and
(f) a seat mounted on the second frame portion so that it is located vertically between said handle and said support foot and horizontally between said handle and said storage compartment.

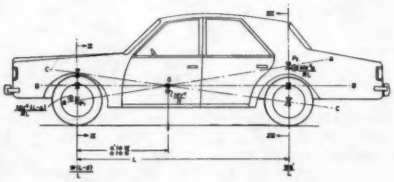
4,603,880
SKI BINDING
Georges P. J. Salomon, Annecy, France, assignor to Salomon S.A., Annecy, France
Filed Dec. 7, 1981, Ser. No. 328,144
Int. Cl.[4] A63C *9/084*
U.S. Cl. 280—628 **37 Claims**

1. A ski safety binding adapted to maintain one end of a ski boot or shoe secured to a ski, said binding comprising:
(a) a jaw adapted to secure the sole of a shoe or boot to said ski, when said binding is in the locked position;
(b) a pivot adapted to be secured to said ski;
(c) a rotatable element mounted pivotably on said pivot; and
(d) a body comprising a housing, an elastic system in said housing, and a movable element in said housing and adapted to be biased against a rocker by said elastic system, said rocker being pivotably mounted relative to said rotatable element, wherein said pivot comprises a support surface integral therewith, adapted to support said rocker during pivoting of said rotatable support element around said pivot, wherein the bias of said movable element



against said rocker is adapted to bias said jaw against said sole when said binding is in the locked position, wherein said housing and said movable element and said elastic system pivot vertically in response to vertical pivoting of said jaw.

4,603,881
VEHICLE SUSPENSION
Stanley J. Mikina, 4782 Coquina Key Dr. SE., St. Petersburg, Fla. 33705
Filed Feb. 11, 1985, Ser. No. 700,594
Int. Cl.[4] B62D *17/00*
U.S. Cl. 280—675 **6 Claims**



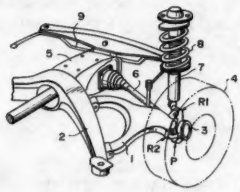
1. In a vehicle consisting of sprung and unsprung masses, the combination of struts and support springs for the weight of the sprung mass, an axis defined by pivots between sprung and unsprung masses, with a front pivot approximately midway between the wheels and near the vertical and horizontal planes through the front axles, with a rear pivot lying in an axis through the front pivot and in a plane through the center-of-gravity of the sprung mass, with said plane parallel to the centrifugal force vector through the center-of-gravity of the sprung mass, and with said rear pivot positioned approximately midway between the rear wheels, means for transmitting the centrifugal force component on the front pivot to the front wheels and ground, and means for transmitting the centrifugal force component on the rear pivot to the rear wheels and ground.

4,603,882

VEHICLE REAR SUSPENSION MECHANISM

Takao Kijima, and Jiro Maebayashi, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation-in-part of Ser. No. 489,106, Apr. 27, 1983, Pat. No. 4,526,400, and Ser. No. 489,132, Apr. 27, 1983, Pat. No. 4,536,007, and Ser. No. 489,492, Apr. 28, 1983, Pat. No. 4,530,513. This application Nov. 2, 1984, Ser. No. 667,688
The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.
Int. Cl.[4] B60G *3/26, 7/00*
U.S. Cl. 280—701 23 Claims



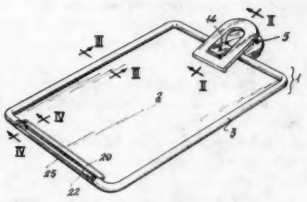
1. A vehicle rear suspension mechanism comprising:
a suspension member connected with a vehicle body;
wheel hub means supporting a rear wheel having a wheel center plane for rotation about a rotating axis; and
connecting means for connecting said wheel hub means with said suspension member, said connecting means including ball joint means having a pivot center located forwardly of and below the rotating axis of the rear wheel and connecting said wheel hub means to said suspension member pivotably about the pivot center, first resilient means located between said wheel hub means and said suspension member rearwardly of and above the rotating axis of the rear wheel, and second resilient means located between said wheel hub means and said suspension member forwardly of and above the rotating axis of the rear wheel.

4,603,883

PAPER SHEET CARRYING BOARD PROVIDED WITH CLIP AND CLOSABLE SEAT FOR CONTAINING WRITING ARTICLES

Raul Barbieri, and Giorgio Marianelli, both of Via Faruffini 13, 20149 Milan, Italy

Filed May 8, 1985, Ser. No. 731,989
Claims priority, application Italy, Jun. 28, 1984, 22420/84[U]
Int. Cl.[4] B32B *3/06*
U.S. Cl. 281—45 12 Claims



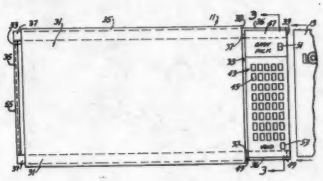
1. A sheet carrying board comprising:
a flat surface;
a raised edge at least partly surrounding said flat surface;
a clip provided on at least one side portion of said raised edge;
an article-containing seat provided in said raised edge and closable.

4,603,884

LOTTO TICKET MARKING GUIDE

David Burton, 11645 Hubbell, Detroit, Mich. 48227

Filed May 23, 1985, Ser. No. 737,100
Int. Cl.[4] B42D *15/00;* G09B *11/04*
U.S. Cl. 283—1 A 3 Claims



1. A marking guide for a lotto ticket having a plurality of laterally arranged imprinted wager sections, with each section having a plurality of longitudinally spaced imprinted boxes in a row and in a plurality of laterally spaced rows, with numerical indicia imprinted in each box, comprising an elongated flattened sleeve open at one end and including top and bottom surfaces;
an elongated channel guide strip having spaced opposed inturned guide flanges nested and secured within said sleeve and projected outwardly of one end thereof providing a marking guide support and a lotto ticket entrant opening in said guide strip between said flanges;
an apertured guide block of a stiff material transversely spanning said guide strip and at its ends mounted upon and secured to said flanges upon said marking guide support;
said guide block having therethrough a plurality of longitudinally spaced rectangular slots in a row and in a plurality of laterally spaced rows corresponding to and adapted for juxtaposition over the rows of boxes of any wager section;
said lotto ticket adapted for lateral projection into said entrant opening so that one of said wager sections underlies said guide block;
whereby the ticket holder by applying a marker through preselected slots corresponding to a preselected series of indicia fills in the corresponding underlying boxes of said wager section;
and on longitudinal incremental advancing of said ticket into said channel guide successive underlying wager sections, respectively;
said wager sections being arranged side by side and with the corresponding slots in said guide block being aligned with the respective rows of boxes of said wager sections.

4,603,885

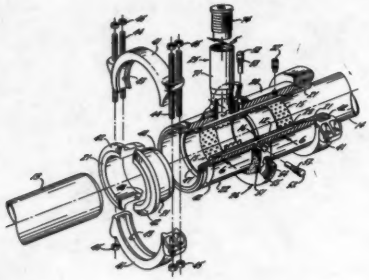
APPARATUS AND STRUCTURE FOR JOINING PIPE

Lee A. Archer, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 276,134, Jun. 22, 1981, Pat. No. 4,488,346. This application Aug. 1, 1984, Ser. No. 636,767
Int. Cl.[4] F16L *21/00*
U.S. Cl. 285—18 5 Claims

1. A pipe joint, comprising two abutted ends of pipe of given diameter; a sleeve interfacing with and surrounding the ends, the yield strength of the sleeve being less than the yield strength of the ends; means for temporarily applying a propellant force substantially along the length of the outer surface of said sleeve and means for containing said propellant force above the sleeve, said propellant force being sufficient to collapse the sleeve around the pipe to form a seal, but insufficient to permanently distort the pipe; and keys embedded in the sleeve and pipe ends at their interface, said keys being dimensioned so as not to enter the surface of said pipe a distance

greater than the allowable surface discontinuity for rating said pipe, the size and number of said keys per unit area times the



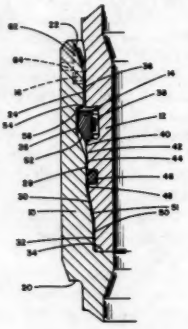
ultimate strength of the pipe material being less than the unit area force exerted by said propellant force.

4,603,886

SNAP TYPE PIPE CONNECTOR

Joseph W. Pallini, Jr., Houston, Tex., and David J. Rohweller, Ventura, Calif., assignors to Vetco Offshore, Inc., Ventura, Calif.

Filed Mar. 26, 1984, Ser. No. 592,508
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—24 **18 Claims**



1. A pin and box snap type pipe connector for large diameter pipe comprising:

a box member having a first cylindrical inside diameter portion adjacent the outboard end of said box member, an intermediate cylindrical inside diamter portion of lesser diameter than said first inside diamter portion at an intermediate location, and a last cylindrical inside diameter porton of still lesser diameter at the inboard end of said box member, an internal landing shoulder at the inboard end of said box member, said box member having an internal circumferential lock ring groove outboard of said intermediate inside diameter portion and adapted to receive a lock ring;

a pin member adapted to fit within said box member and having a first cylindrical outside diameter portion adjacent the inboard end of said pin member, an intermediate cylindrical outside diameter portion of lesser diameter than said first outside diameter at an intermediate location, a last cylindrical outside diameter portion of a lesser diameter than said intermediate outside diameter adjacent the outboard end of said pin member, an end face for abutting said box shoulder;

an external circumferential lock ring groove in said pin between said first and said outside intermediate diameter portions;

an outwardly biased split lock ring sized to fit within said lock ring grooves;

means for contracting said lock ring to permit release;

there being a first, intermediate, and last clearance between corresponding cylindrical portions of said pin and box when said end face abuts said shoulder; and

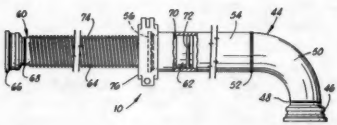
the diameters sized such that said intermediate clearance is less than both said first and last clearances.

4,603,887

RIGID ADJUSTABLE LENGTH ASSEMBLY

Terry D. Mayfield, and William D. Kendrick, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 1, 1984, Ser. No. 656,396
Int. Cl.[4] F16L *27/12*
U.S. Cl. 285—32 **13 Claims**



1. An adjustable length manifold assembly, comprising:

a rigid outer body having a bore defining a first hollow interior region;

a rigid inner body having an outer wall defining a second hollow interior region for communicating with said first hollow interior region, said outer wall having a first thread defined thereon; and

connector means for connecting said inner body with said outer body so that said inner body is rigidly held in a selectable position relative to said outer body, said connector means having an interior semicircular surface portion with a second thread defined thereon for engaging with said first thread of said inner body and said connector means being rotatable, in a first state of retention on said body, relative to said inner body for adjusting the relative positions of said inner and outer bodies and said connector means being fixed, in a second state of retention on said outer body, relative to said inner body, said connector means including:

a first yoke having a first semicircular surface and a second semicircular surface offset from said first semicircular surface;

a second yoke having a third semicircular surface and a fourth semicircular surface offset from said third semicircular surface;

hinge means for pivotally connecting said first and second yokes so that said first and third semicircular surfaces are aligned, thereby defining a first semicircular engagement surface for engaging a first portion of said outer wall of inner body, and so that said second and fourth semicircular surfaces are aligned, thereby defining a second semicircular engagement surface for engaging a second portion of said outer body; and

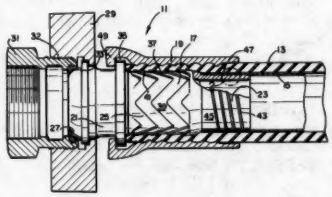
closure means for closing said first and second yokes to a selectable one of said first and second states of retention.

4,603,888

END FITTING

Richard L. Goodall, and Paramjit Singh, both of Chestertown, Md., assignors to Dixon Valve & Coupling Company, Chestertown, Md.

Filed Sep. 18, 1985, Ser. No. 777,350
Int. Cl.[4] F16L *9/14*
U.S. Cl. 285—55 **5 Claims**



1. An end fitting assembly for rubber steam hoses with metal liners of interlocking construction comprising

a stem having an outer end portion, an intermediate portion and an inner end portion,

said intermediate portion and inner end portion being received within the hose,

zig-zag serrations formed on and circumferentially around the outer surface of the intermediate portion of the stem contacting and retaiing the inside of a rubber hose,

rib-type hand spirals formed on the outer surface of the stem's inner end portion so that the metal liner of interlocking construction is screwed onto the spirals for retention of the metal liner on the stem and preventing the metal liner from being pulled off the stem,

and clamping means for clamping the rubber hose against the zig-zag serrations of the intermediate portion of the stem for sealing the end fitting against the escape of steam, and for clamping the rubber hose against the metal liner and the metal liner against the spirals and stem inner end portion to provide added retention of the metal liner from being pulled off the stem,

the length of the stem inner portion in relation to the length of the clamping means being such that a portion of the metal liner is always between the stem and the clamping means to provide extra retention and safety against pull out.

4,603,889

DIFFERENTIAL PITCH THREADED FASTENER, AND ASSEMBLY

James W. Welsh, 6460 Printwood, San Diego, Calif. 92117

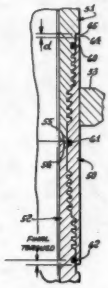
Continuation-in-part of Ser. No. 335,230, Dec. 28, 1981, Pat. No. 4,479,666, which is a continuation of Ser. No. 101,204, Dec. 7, 1979, Pat. No. 4,310,181. This application Aug. 1, 1983, Ser. No. 519,021
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—175 **8 Claims**

1. In combination,

(a) upper and lower pipes and a tubular connector interconnecting said pipes so that the connector and pipes extend in coaxial relation,

(b) the upper pipe having two stepped external pin thread, and the lower pipe having two stepped external pin threads, the connector having two stepped upper box threads meshing with the upper pipe pin threads, and two stepped lower box threads meshing with the lower pipe pin threads,

(c) the connector upper box threads having first load flanks which face in one axial direction, and the connector lower box threads having second load flanks which face in the opposite axial direction, the first flanks defining a first pitch and the second flanks defining a second pitch, said pitches being different and characterized in that after the upper pipe endwise bottoms on the lower pipe and when the connector is rotated, the first flanks tighten against the upper pin threads and the second flanks tighten against the lower pipe threads,



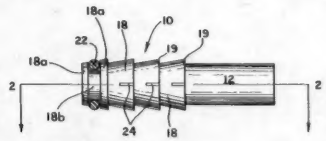
(d) the connector having an outer diameter along its length, which is substantially flush with the outer diameter defined by said pipes, and the connector having an inner diameter along its length which is everywhere less than the inner diameter defined by said pipes.

4,603,890

BARBED TUBING CONNECTOR

Robert Huppee, 1910 Thierry, Brossard, Quebec, Canada J4W 2M8

Filed Dec. 6, 1984, Ser. No. 679,001
Int. Cl.[4] F16L *33/00*
U.S. Cl. 285—239 **8 Claims**



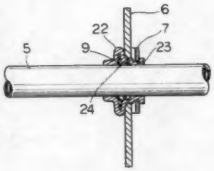
8. A tubing connector for sealingly engaging the end portion of a flexible and somewhat elastic tubing adapted to carry a pressurized fluid, said connector comprising a rigid tubular body having a free end for insertion into said tubing, an endmost barb at said free end and additional, longitudinally spaced apart frusto-conical barbs protruding from the outer surface of said body, all of said barbs being concentric and flaring away from said body free end, the frusto-conical surface of said endmost barb having a peripheral groove and an O-ring engaging said groove and protruding outwardly from said frusto-conical surface, said barbs adapted to be inserted into and expand said tubing end portion, said O-ring then sealing said tubing over said connector and preventing fluid pressure build-up in the portion of said tubing surrounding said barbs, whereby said barbs can resist pull-out of the tubing from said connector.

4,603,891

HOSE MIDWAY HOLDER

Takeshi Miyazaki, Inazawa, and Kenji Sugiyama, Gifu, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Aug. 28, 1984, Ser. No. 645,153
Claims priority, application Japan, Aug. 29, 1983, 58-133321[U]
Int. Cl.⁴ F16L *5/00*
U.S. Cl. 285—205 **6 Claims**



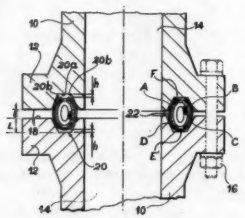
1. A mounting device for fitting about a hose, said device being comprised of a generally tubular member cut to a predetermined length, said tubular member being axially deformed to define a radially outwardly extending flanged portion and a radially extending interior chamber, the outer circumference of said flanged portion having at least one flat exterior face defined by a cordal plane extending therethrough, said interior chamber having at least one inwardly recessed interior wall portion, means defining a communication port between said chamber and the outside of said device and filler material injected through said port means into said interior chamber to fill said chamber and to bond to the hose, so that relative motion between said hose and said device is prevented by said filler material in cooperation with said hose and said at least one inwardly recessed interior wall portion.

4,603,892

TIGHT CONNECTION DEVICE

Claude Abbes, St. Etienne; Raymond De Villepoix, Donzére, and Christian Rouaud, Bourg St. Andeol, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 21, 1985, Ser. No. 714,264
Claims priority, application France, Apr. 5, 1984, 84 05380
Int. Cl.⁴ F16L *17/06*
U.S. Cl. 285—336 **13 Claims**



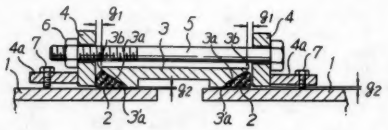
1. A tight connecting assembly comprising:
(a) two flanges having opposing faces and opposing grooves in said opposing faces, each one of said opposing grooves being trapezoidal in cross-section and having a bottom and two sides;
(b) means for fastening said two flanges together; and
(c) a flexible joint disposed in said opposing grooves, said flexible joint comprising:
(i) at least one annular hollow elastic metal core, said at least one annular hollow elastic metal core having an oral cross-section in its rest state, said oval cross-section having a major axis and a minor axis, one of said axes being located in the plane of symmetry of said flexible joint, and
(ii) at least one flexible envelope surrounding said at least one annular hollow elastic metal core except for an opening located on one of said axes of said oval cross-section,
said flexible joint being sized, shaped, and positioned so that, when said tight connecting assembly is assembled, said flexible joint is in tight contact with said two sides of each of said opposing grooves and abuts said bottom of each of said opposing grooves.

4,603,893

PIPE COUPLING JOINT

Saburo Takahashi, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,467
Int. Cl.⁴ F16L *17/02*
U.S. Cl. 285—342 **6 Claims**



1. A pipe coupling for joining first and second pipes end-to-end, comprising:
a cylindrical middle ring having a longitudinal axis and having first and second mating middle ring surfaces at respective opposite first and second longitudinal ends of said middle ring, said first and second mating middle ring surfaces respectively including
first and second conical clamping faces facing toward said axis and extending in opposite axial directions at respective first and second acute angles with respect to said axis,
first and second annular step surface portions respectively radially inward of said first and second conical clamping faces, extending radially outward at respective angles to said axis which are respectively substantially greater than said first and second acute angles, so as to respectively intersect said first and second conical clamping faces, and
first and second axially spaced apart elastic annular packings respectively disposed at said opposite ends and facing said first and second mating middle ring surfaces, each having an annular inclined mating surface inclined so as to mate with a respective one of said first and second clamping faces, and each having a radially inner surface for facing the outer surfaces of the first and second pipes; and
means for urging said first and second packings toward each other while respectively on the first and second pipes to be joined, with said center ring therebetween surrounding the first and second pipes, so as to seal said first and second packing on the first and second pipes, said means including first and second axially spaced apart cylindrical clamping rings disposed so that said first and second packings and said middle ring are disposed therebetween;
said first and second packings respectively opposing said first and second clamping rings, each of said first and second packings further including
an annular radially outer surface extending from a radially outer edge of said annular inclined mating surface radially inwardly and axially toward the one of said first and second clamping rings opposed thereto,
a clamping ring engaging surface extending radially inwardly from an end of said annular radially outer surface opposite said radially outer edge, and
an annular packing step surface angled to mate with a re-

spective one of said first and second annular step surface portions of said middle ring;

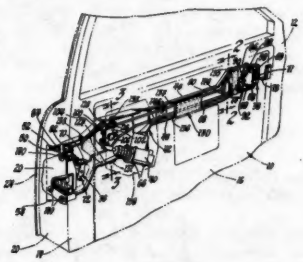
said first and second clamping rings being movable axially toward each other so as to engage the respective clamping ring engaging surfaces of said first and second packings with respective spaces between said first and second clamping rings and the mating ring surfaces opposed thereto, said spaces being directly above and exposed to the radially outer surfaces of said first and second packings.

4,603,894

LOCK AND HANDLE MODULE FOR VEHICLE DOOR

Joseph M. Osenkowski, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1984, Ser. No. 592,357
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 **1 Claim**



1. In a longitudinal extending vehicle body door hingedly mounted on a vehicle body and having a door lock assembly mounted on a transverse extending rear wall of the free swinging end of the door for latching the door in the closed position and an inside handle assembly located longitudinally forward and remote from the door lock assembly and connected to the door lock assembly by a fixed length inside handle connecting rod for enabling a vehicle occupant to unlatch the door lock assembly from inside the occupant compartment and said inside handle assembly having a lock handle connected to the door lock assembly by a lock to lock and unlock the door lock assembly, the improvement comprising:

a stamped metal frame having a transverse extending rear end wall adapted to abut against the transverse extending rear end wall of the door and a longitudinally extending forward end portion adapted to reach forwardly to a location providing occupant accessible mounting of the remote inside handle assembly, said frame having top and bottom edges with integral stiffening flanges projecting therefrom and at least said upper flange overlying the connecting rod;

first means attaching the door lock assembly on the transverse extending rear end wall of the frame and second means independent from the first means attaching the inside handle assembly on the forward end portion of the frame to establish the relative mounting locations of the door lock assembly and the inside handle assembly at a fixed length longitudinal spaced apart relationship relative one another so that attachment of the fixed length connecting rod therebetween reliably effects unlatching movement of the door lock assembly upon operator actuation of the inside handle assembly independently of mounting of the door lock assembly and inside handle assembly on the vehicle door;

means attaching the frame on the vehicle door so that the transverse extending rear end wall of the frame and the door lock assembly mounted thereon are mounted upon the transverse extending rear end wall of the door and the inside handle assembly is mounted upon the door remote from the door lock and at a predetermined consistent fixed length spacing therefrom to assure proper operation of the door lock assembly by the remote inside handle; and

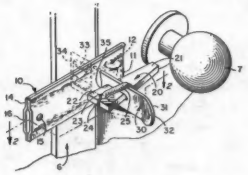
a cover mounted on the integral stiffening flanges of the frame and cooperating therewith to substantially enclose the lock rod to prevent tampering with the lock rod and unauthorized entry into the vehicle.

4,603,895

COMBINATION PADDED SECURITY LOCK AND CARRIER THEREFOR

Albert Langenbahn, 704 S. Morgan, Mason City, Ill. 62664

Filed Jul. 25, 1984, Ser. No. 634,326
Int. Cl.[4] E05C *19/18*
U.S. Cl. 292—295 **7 Claims**



1. A combination padded security lock and carrier therefor for use with a hinged door assembly, said door assembly comprising a door provided with a knob-releasable spring latch cooperating with a door jamb provided with a striker plate, said striker plate being provided with a latch receiving aperture in alignment with said spring latch, said padded security lock comprising:

a lock bar having first and second flat surfaces and at least one tang adjacent to an end of said lock bar, and an aperture in the opposite end thereof, said at least one tang off-standing perpendicularly from said first surface and extending in a longitudinal direction and being adapted for emplacement in said latch receiving aperture, said lock bar being interposable between said door and said jamb as said door is closed with said first surface in abutment with said jamb so that said tang is retained in said latch aperture, a smooth surface tapered key element, said lock bar being provided with a longitudinally extending slot means extending from said first surface to said second surface arranged to receive said tapered key element;

a lock body comprising an open ended elongated sleeve member having surface areas and a heel element encapsulated in a pocket in a closed end thereof, said lock body being provided with a transverse slot means juxtaposed said heel element and arranged to receive said lock bar normal thereto so as to abut said door when closed;

said tapered key element adapted to be positioned in a horizontal direction in said longitudinal slot means in said lock bar in abutting parallel relation with said lock body including said heel element with said lock body and said heel element between said tapered key element and said door with one end of said tapered key element forced against said heel element so as to protect said door from marring by said tapered key element while serving to lock said door, said tapered key element having an extensible retention means secured thereto and extendable over said lock bar to urge said tapered key element into said longitudinal slot whereby the key element is urged into a positive locking position whereby undesired opening of said door would be prevented should said door be shaken in an attempt to dislodge said padded security lock.

4,603,896

METHOD AND GRIPPING HEAD FOR GRIPPING A LAYER OF CONTAINERS ARRANGED ON A PLANE

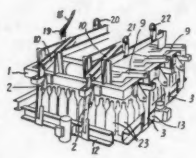
Jackie Vasseur, and Roger Vasseur, both of Dunkerque, France, assignors to S.A. Atecmi, Grand Synthe, France

Filed Oct. 26, 1984, Ser. No. 664,967

Claims priority, application France, Oct. 28, 1983, 83 17506; Jul. 9, 1984, 84 11258

Int. Cl.[4] B66C *1/04, 1/44*

U.S. Cl. 294—2 16 Claims



4. A head for gripping a layer of containers (23), placed upright on a plane so as to cause said containers to occupy a rectangular area on the plane in such a way that the containers are aligned and bear against each other so as to form rows of containers and these rows are offset in a longitudinal direction from each other by a distance such that, in a transverse direction of the layer, the containers are disposed in a quincunx arrangement, comprising means for movably supporting the head for handling thereof and positioning of the head with respect to the layer of containers to be gripped, said head including a frame (1), four mobile jaws (12 to 15) associated with the frame (1), piston and cylinder means (6, 7) operably connected for actuating said jaws (12 to 15) to cause said jaws to surround the layer of containers (23) on four sides of the layer at the level of the container bodies and nip the surface of the outer containers of the layers, and vibrator means (17) operably connected for vibrating said jaws upon actuation of said vibrator means.

4,603,897

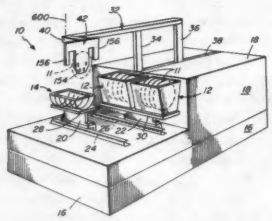
VACUUM PICKUP APPARATUS

Richard F. Foulke, Carlisle, and Kenneth A. Winchell, Melrose, both of Mass., assignors to Poconics International, Inc., Woburn, Mass.

Filed May 20, 1983, Ser. No. 496,460

Int. Cl.[4] B65G *17/32*

U.S. Cl. 294—64.1 10 Claims



1. Apparatus for transporting an object, said apparatus comprising

an engagement element with a plurality of openings in a flat surface, a first said opening being on one side of an axis passing through said element, and a second said opening being on another side of said axis,

suction means for providing a below-atmospheric pressure at said openings for the purpose of adhering said object to said engagement element,

transport means for transporting said engagement element relative to said object to bring said openings close enough to a flat engagement surface of said object to enable suction engagement of said object at said openings,

said transport means including means for rotating said engagement element about an axis parallel to said flat surface,

position detection means for sensing the relative position of said object and said engagement element,

sensing means for sensing suction engagement at said openings, and

processing means including

engagement-failure-detection means responsive to said sensing and position detection means for detecting when suction engagement has occurred at said first opening but has not occurred at said second opening despite said engagement element having been transported toward said object a distance sufficient to enable said engagement, and

control means responsive to said engagementfailure-detection means for providing a control signal to said transport means to rotate said engagement element to bring said second opening closer to said object.

4,603,898

APPARATUS FOR INHIBITING FOREIGN MATERIAL FROM BEING DEPOSITED ON REAR WINDOW OF A MOTORCAR

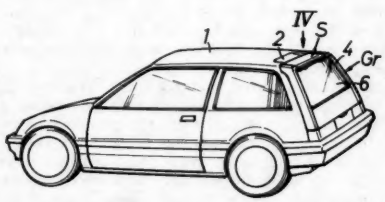
Masakazu Udagawa, Fujimi; Masaaki Saito, Wako; Shingo Segawa, Kawagoe, and Masahiro Noda, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,520

Claims priority, application Japan, Aug. 24, 1983, 58-130913[U]; Aug. 24, 1983, 58-130915[U]; Aug. 24, 1983, 58-130918[U]

Int. Cl.[4] B62D *37/02*

U.S. Cl. 296—91 33 Claims



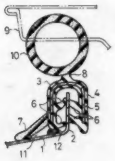
1. An apparatus for inhibiting foreign material from being deposited on a rear window of a motorcar comprising a first inclined air introduction surface extending in a rearward and downward direction from a rear laterally middle part of an upper surface of a body roof, a second inclined air introduction surface formed on a laterally middle part of a rear window frame and extending rearwardly from said first inclined air introduction surface in a continuous and flush manner and an air flow control plate fixedly mounted on said second inclined air introduction surface on the rear window frame so as to allow air introduced into both the first and second inclined air introduction surfaces to flow along an upper surface of a rear windshield fitted to the rear window frame, said air flow control plate having an upper surface located flush with the upper surface of the body roof and an upper surface of the rear window frame, and having an upper half and a lower half, said lower half having a plurality of legs projecting downwardly from a lower surface thereof, said legs being fixedly secured to the second inclined air introduction surface.

4,603,899

WEATHER STRIP

Tadanobu Iwasa, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jul. 29, 1985, Ser. No. 760,248
Claims priority, application Japan, Jul. 31, 1984, 59-162324
Int. Cl.[4] B60R *13/06*
U.S. Cl. 296—154 11 Claims



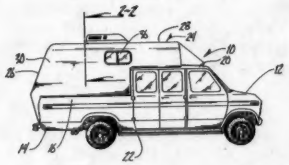
1. A weather strip comprising:
(a) a main body;
(b) said main body having a water passage; and
(c) a water flow promoting member provided in said water passage, forming an integral part of said main body and containing a hydrophilic material.

4,603,900

UPPER BED STRUCTURE FOR A RECREATIONAL VEHICLE

John N. Dodgen, Fort Dodge, Iowa, assignor to Dodgen Industries, Inc., Humboldt, Iowa

Filed Jan. 14, 1985, Ser. No. 691,392
Int. Cl.[4] B60P *3/38*
U.S. Cl. 296—156 1 Claim



1. In combination with a van vehicle having an interior compartment, a rearward end and a forward end, and an upper portion,

a storage compartment in the upper portion of said van adjacent its rearward end comprising a horizontal deck having forward and rearward ends and opposite side edge portions, and a panel structure hinged to the forward end of said deck and having opposite side edge portions,

means on said panel structure for releasably rigidly securing said panel structure in a vertical position,

horizontal ledge means extending substantially continuously along each side of said interior compartment at the level of said horizontal deck for supporting said horizontal deck along the side edge portions thereof, such that the area beneath the horizontal deck is substantially free from obstructions, and whereupon said panel structure can be pivoted to a horizontal position with its side edge portions resting on said ledge means to provide an auxiliary deck portion coplanar with said horizontal deck,

door means on said panel structure for providing access to said storage compartment when said panel structure is secured in said vertical position, said door means having a supporting surface less than that of said panel structure, and being located inwardly away from the perimeter of said panel structure, and

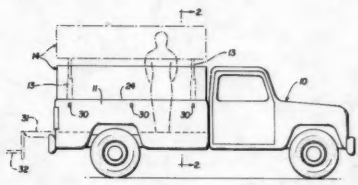
mattress means in said storage compartment to substantially cover said horizontal deck and said auxiliary deck to create a bed means thereon, said mattress means including a single mattress component that covers said door means and said panel structure.

4,603,901

LIFTABLE TOP FOR PICKUP TRUCKS

Kenneth B. McIntosh, Rte. 1, Box 479, Rockvale, Tenn. 37153, and Clyde Howard, Rte. 11, Sulphur Springs Rd., Murfreesboro, Tenn. 37130

Filed Dec. 18, 1984, Ser. No. 682,860
Int. Cl.[4] B60P *3/34*
U.S. Cl. 296—165 4 Claims



1. In a pickup truck or like vehicle, a cargo box having side walls and hollow side board mounts within the side walls, vertical axis screw jacks having bases installed within said side board mounts, a camper top for said cargo box, drive motors for the screw jacks operatively coupled to said jacks and being fixedly attached to the camper top, whereby the camper top is bodily supported on and raised and lowered by the screw jacks, the screw jacks and drive motors being four in number and being disposed adjacent to the four corners of the cargo box and camper top, and opposite side bottom horizontal longitudinal flanges on the camper top, said drive motors comprising horizontal axis motors, gearing operatively connecting the shafts of said motors with said screw jacks, and brackets fixedly holding said motors on the camper top and being secured to said flanges.

4,603,902

FOLDABLE HIGH CHAIR

Kevin Maloney, Columbus, Ind., assignor to Cosco, Inc., Columbus, Ind.

Filed Feb. 21, 1984, Ser. No. 581,977
Int. Cl.[4] A47C *4/00*
U.S. Cl. 297—35 22 Claims

1. A foldable high chair having a use position wherein an occupant can occupy the chair and a folded position wherein the chair can be folded for storage comprising

a seat having a base portion and a back portion,

a frame including a front leg and a rear leg for supporting the seat,

a first pivot means for pivotally coupling the base portion to the front leg,

a second pivot means for pivotally coupling the base portion to the rear leg,

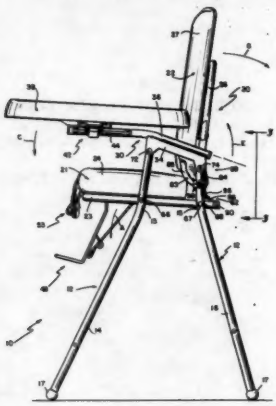
a third pivot means for pivotally coupling the back support portion to the rear leg,

a link means for coupling the back support portion to the base portion,

a fourth pivot means for pivotally coupling the link means to the base portion, and

a fifth pivot means for pivotally coupling the link means to the back support portion,

the frame, seat, pivot means and link means cooperating to pivot the base portion in one direction and to pivot the back support portion in an opposite direction away from the base portion.

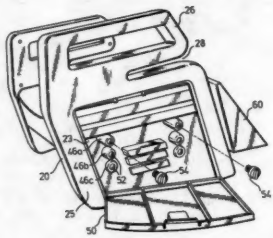


4,603,903

ADJUSTABLE CAR SEAT

Jerry N. Moscovitch, Toronto, Canada, assignor to BoPeep Nursery Products Limited, Toronto, Canada

Filed Aug. 21, 1984, Ser. No. 642,843
Claims priority, application Canada, Jun. 14, 1984, 456573
Int. Cl.[4] A47D *1/10*
U.S. Cl. 297—250 **23 Claims**



1. An adjustable child's seat for use in association with a base on which the seat may be placed, such as the seating means of a vehicle having seat belts affixed to the vehicle, or a table, wherein said child's seat comprises:

a bench;

side pedestals on each of two opposite sides of the bench;

releasable support means supporting the bench on each pedestal at any of a plurality of vertically spaced-apart positions; and

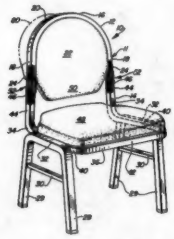
spacer means laterally spacing the pedestals at any one of a plurality of predetermined distances apart, said releasable support means and spacer means so constructed to narrow the lateral spacing of the pedestals when said bench is supported therebetween at upper positions and to widen the lateral spacing of the pedestals when said bench is supported therebetween at lower positions; and fastening means for fastening said pedestals to the bench.

4,603,904

CHAIR WITH ARTICULATED, FLEXIBLE SPRING BACKREST

Thomas H. Tolleson, and Steve B. Hartzog, both of Morristown, Tenn., assignors to Shelby Williams Industries, Inc., Morristown, Tenn.

Filed Aug. 12, 1985, Ser. No. 764,557
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—296 **16 Claims**



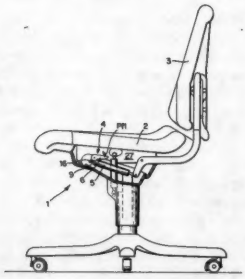
1. A chair comprising, a seat assembly which includes a support frame and depending leg members, a lower backrest frame part having a pair of spaced apart frame members upstanding relative to the seat support frame, an upper backrest frame part having a pair of spaced apart depending frame members arranged in registry with the upstanding frame members, said frame members being hollow with open extremities, and spring members secured between each registered pair of frame members to provide an articulated, flexible spring backrest for the chair, each spring means including a molded plastic support strut with an elongate passageway therein, a substantially non-extensible flexible member disposed within said passageway and means securing said flexible member at each end of said passageway so as to maintain the strut under longitudinal compression and limit the elongation thereof when a force is exerted on the backrest.

4,603,905

CONTROL MECHANISM FOR AN ADJUSTABLE CHAIR OR THE LIKE

Felix Stucki, Thunstetten, Switzerland, assignor to Girsberger Aktiengesellschaft, Bützberg, Switzerland

Filed Sep. 24, 1984, Ser. No. 653,924
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334424
Int. Cl.[4] A47C *1/022*
U.S. Cl. 297—300 **26 Claims**



1. A control mechanism for a seating article having at least one adjustable component, particularly a seat or a back rest, which is connected with a biasing element, especially an air spring, convertible between a first condition in which the

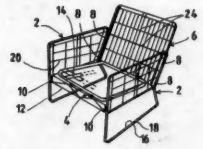
biasing element offers a higher first resistance to adjustment, and a second condition in which the biasing element offers a lower second resistance to adjustment, said control mechanism comprising a control element for converting the biasing element between its first and second conditions; a coupling unit for transmitting force between said control element and the biasing element, said coupling unit having a first locked position in which the biasing element is in its first condition, and a second locked position in which the biasing element is in its second condition, and said coupling unit being designed to alternately assume said first and second locked positions in response to movement of said control element; relatively rotatable first and second shafts one of which is connected with said control element and the other of which is designed to operate said biasing element, said coupling unit constituting a junction between said shafts and said coupling unit comprising cooperating first and second elements which are respectively fast with said first and second shafts; and an arresting element movable to and from an arresting position in which said arresting element arrests said first element and thereby holds said coupling unit in one of said locked positions.

4,603,906

SEPARABLE PIECE OF FURNITURE

Lars Mathiesen, St. Kongensgade 110B, DK-1264 Copenhagen, Denmark

Filed May 6, 1985, Ser. No. 731,016
Claims priority, application Denmark, May 11, 1984, 2381/84
Int. Cl.[4] A47C *7/00*
U.S. Cl. 297—440 **9 Claims**



1. A separable piece of furniture comprising a first and a second panel element which are joinable edge to edge in a separable manner, characterized in that the first panel element is provided with a freely protruding coupling part, which is outwardly wound first to one and then to an opposite side so as to form mutually opposed sinuosities, and that the edge portion of the second panel element as connected with said coupling part includes two parallel pipe holding portions, which are cast substantially apart just sufficiently to enable the coupling part to be inserted, relatively, into and through the clearance between the holding portions and, by a relative rotation of the two panel elements about one of the holding portions as hereby being rested in the outermost of said sinuosities, enable the other of said holding portions to be brought into a butting engagement with the innermost sinuosity of the coupling part.

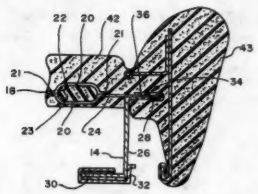
4,603,907

J-CLIP MOUNTING SYSTEM FOR LOAD BEARING SEAT MEMBERS

Duane W. Witzke, Logan, Ohio, assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Nov. 30, 1983, Ser. No. 556,482
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 **5 Claims**

1. In a vehicle seat which includes a frame having a cushion portion, said cushion portion including a pair of side rails having upright portions and upper flanges which extend outwardly from each other, a load carrying web adapted to be mounted on and extend between said side rails, a foam body on said frame and extended upwardly from and secured to said web and mounting members secured to said web and mounted on said upper flanges, said mounting members constituting the sole support for said web on said frame for maintaining said web in tension on said flanges, said mounting members com-



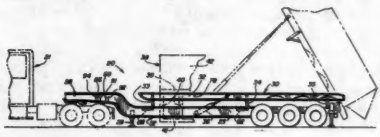
prising substantially continuous strips secured to opposite edges of said membrane, each of said strips being of a return bent upon itself shape in cross section and being hooked over one of said flanges.

4,603,908

HYDRAULIC LIFT DECK UPLOCK MECHANISM

Leslie A. Weaver, Monticello, Ind., assignor to Eugene A. LeBoeuf, Gary, Ind.

Filed Sep. 27, 1984, Ser. No. 655,850
Int. Cl.[4] B60P *1/34*
U.S. Cl. 298—17 R **15 Claims**



12. A tractor drawn trailer for use with pallet frame units adapted to carry high tonnage loads, said trailer comprising the combination of:

(a) a main support frame including means for direct connection to a tractor;

(b) a lift deck mounted in superimposed relation on said main frame and adapted to support a pallet frame unit;

(c) a plurality of hinge panels pivotally connected at their lower ends to said main support frame and at their upper ends to said lift deck constraining the latter to be raised and lowered in generally parallel relation with the former;

(d) single acting fluid actuator means for elevating said lift deck to raised transport position wherein each said hinge panel has been arrested approximately 5 degrees short of vertical orientation;

(e) valve means for draining pressure fluid from said single acting actuator means to cause said lift deck to descend by gravity to lowered loading position;

(f) uplock means including a pair of toggle links interposed between one said hinge panel and said lift deck, said pair of toggle links being pivotally interconnected;

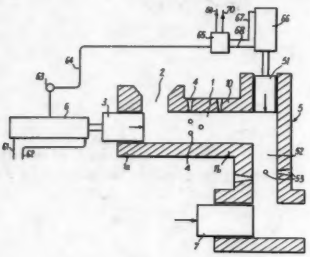
(g) said pair of pivotally interconnected links being constructed and arranged so that they define a self-locking relationship when said lift deck is in a raised transport position, and can be shifted to an unlocked relationship to permit departure from said raised transport position toward lowered loading position; and

(h) a power actuator for moving said links of said uplock means into and out of their self-locking relationship.

4,603,909
DEVICE FOR SEPARATING PHASES FOR RIGID MULTIPHASE MATERIALS

Gwénolé Le Jeune, Rue du Vignoble, 44450 St Julien de Concelles, France

Filed Mar. 30, 1983, Ser. No. 480,615
Int. Cl.[4] B30B *9/06*
U.S. Cl. 299—7 10 Claims

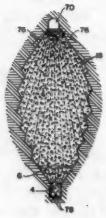


1. A device for separating the liquid phase form the solid phase of rigid multiphase materials such as bituminous schists, domestic waste and vegetables, said device comprising a cylindrical longitudinal chamber (1) having orifices (4) in its cylindrical wall, said chamber having an inlet end (1*a*) and an outlet end (1*b*), the inlet end having a lateral loading opening (2), a first axial compression piston (3) mounted within said cylindrical longitudinal chamber (1) at said inlet end and being operated by a hydraulic jack (6), the volume of the chamber being substantially greater than the stroke volume of the first axial compression piston (3) to permit the compacted material to remain in the chamber for a time interval substantially greater than one cycle; whereby, the material therein are exposed to compression pressure during a number of cycles which enables the fluid material to be extracted in the desired proportion, and the outlet end being open and equipped with an extrcation and metering system (5) responsive to the pressure in the hydraulic jack (6) operating said first axial compression piston (3) so as to maintain a minimum pressure in the chamber even during the return stroke of the first axial compression piston 3.

4,603,910
METHOD OF BLASTING ROCK CAVERNS WITH LARGE CROSS-SECTIONAL AREA

Per Lanéus, Vallingby, Sweden, assignor to JCC Construction Company AB, Stockholm, Sweden

Filed Mar. 21, 1984, Ser. No. 591,683
Claims priority, application Sweden, Mar. 23, 1983, 8301601
Int. Cl.[4] E21D *13/02*
U.S. Cl. 299—13 6 Claims

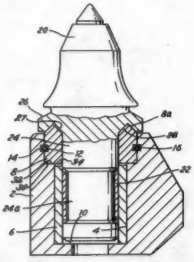


1. A method of blasting essentially elongated rock caverns with a large cross-sectional area, preferably for the storage of liquids such as water and oil, comprising carrying through intersection blasting in accordance with the sublevel stoping method from at least one drift near the bottom of the intended rock cavern, to produce at least one upwardly widening part section of said cavern, and forming said cavern to its final cross-section by excavating rock above this part section through successive drilling and blasting of rock layers, said drilling comprising fan-shaped downwardly directed drilling to obtain an essentially lentiform cross-section of said cavern above said part section, the side walls of which at least partially lie outside the greatest cross-sectional width of said part section.

4,603,911
PICK HOLDING ARRANGEMENTS

Leslie W. Hindmarsh; Robert G. Knight, and Gerald J. Sanders, all of Nuneaton, United Kingdom, assignors to Santrade Ltd., Lucerne, Switzerland

Filed Mar. 7, 1984, Ser. No. 587,224
Claims priority, application United Kingdom, Mar. 10, 1983, 8306641
Int. Cl.[4] E21C *35/18*
U.S. Cl. 299—91 8 Claims



1. A holding arrangement for a cutter pick of the type comprising a rearwardly open, forwardly tapering recess, said holding arrangement comprising:

a pick box containing a forwardly open bore defining a front-to-rear extending longitudinal axis and including a radial shoulder,

a sleeve disposed within and lining at least a portion of said bore and sized to receive therein a shank of the pick, said sleeve being rotatable about said axis to permit rotation of the pick about said axis; and

a thrust ring extending into a front end of said bore and retained therein against axial dislodgement, said thrust ring arranged to closely fit said pick and said bore to impede the passage of foreign matter into said bore, said thrust ring including a front end face and a rear radial surface bearing against said shoulder for resisting axial inward forces applied thereagainst by the pick during a cutting action, and a radially extending portion extending into the path of said sleeve for preventing axial dislodgement thereof,

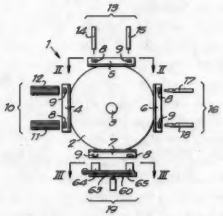
said front end face defined by a first portion extending radially outwardly and axially forwardly, and a second portion extending radially inwardly and axially forwardly, said first and second portions converging forwardly in V-shape to engage first and second forwardly converging surfaces of said recess formed in said pick.

4,603,912

BRUSH MANUFACTURING MACHINE

Leonel P. Boucherie, Roeselare-Rumbeke, Belgium, assignor to Firma G.B. Boucherie, Belgium

Continuation of Ser. No. 470,951, Mar. 1, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,301
Claims priority, application Belgium, Mar. 4, 1982, 2/59614
Int. Cl.[4] B25B *1/20, 11/00*
U.S. Cl. 300—2 8 Claims



1. A machine for manufacturing a plural faced brush wherein manufacturing operations are performed on individual faces of a brush body comprising:

(a) a brush body carrier;

(b) clamping means mounted on the brush body carrier including two clamping components disposed in line with each other having means for engaging ends of the brush body attached to axially movable pins;

(c) means for moving the pins axially such that the clamping components are moved toward or away from each other so as to clamp the brush body therebetween;

(d) indexing means to turn the pins, the clamping components and the brush body engaged therein through an angle of less than 360° and to subsequently hold the brush body stationary so as to permit manufacturing operations to be separately performed on each face of the brush body; and,

(e) means to transport the brush body carrier between a plurality of manufacturing operation stations.

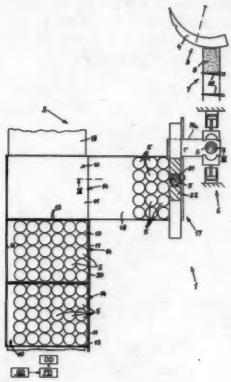
4,603,913

APPARATUS FOR STORING AND MANIPULATING BUNDLES OF BRISTLES IN BRUSH MAKING MACHINES

Benno Dörflinger, and Walter Steinebrunner, both of Todtnau, Fed. Rep. of Germany, assignors to Anton Zahoransky, Todtnau, Fed. Rep. of Germany

Filed Jan. 16, 1985, Ser. No. 691,897
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402051
Int. Cl.[4] A46D *1/04*
U.S. Cl. 300—7 26 Claims

1. In a brush making machine wherein bristles are confined in at least one magazine and the supply of bristles must be replenished at intervals by the admission of batches of arrayed bristles, apparatus for storing bundles of wrapped batches of bristles an for delivering such batches to the magazine, comprising a source of bundles including at least one support for maintaining a set of neighboring bundles in substantially upright positions; means for receiving bundles from said source, including a singularizing device arranged to accept discrete bundles from said source; and means for unwrapping the



batches of bristles between said singularizing device and said magazine.

4,603,914

AXIALLY ADJUSTABLE VEHICLE WHEEL COVER

Trevor J. Brown, Rochester, and Eugene S. Dipzinski, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1985, Ser. No. 708,006
Int. Cl.[4] B60B *7/04, 7/06*
U.S. Cl. 301—37 P 5 Claims

1. The combination comprising, a vehicle wheel having an annular retention flange, a wheel cover of plastic material having an annular retention flange provided with a plurality of annularly spaced axially and radially extending projections, an annular retention band provided with a plurality of axially extending openings, each respective to and receiving a projection of the cover flange therethrough, cooperating means on the band and on the projections frictionally interengageable to lock the band to the retention flange of the cover, retaining means on the band releasably engageable with the retention flange of the wheel to releasably retain the cover to the wheel, the openings of the band having a greater axial extent than the axial extent of the respective projections and permitting movement of the cover relative to the band, the cover being adjustable relative to the wheel after engagement of the retaining means of the band with the retention flange of the wheel upon the application of a force to the cover sufficient to overcome the frictional force of the cooperating means on the band and on the projections.

4,603,915

WHEEL COVER WITH A WIRE SPRING RING

Harald M. Heintz, Weinstadt, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 586,974

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315342

Int. Cl.[4] B60B *7/06*

U.S. Cl. 301—37 P 16 Claims

1. A wheel cover comprising a wire ring, at least two guide means, said wire ring being received in the installed condition by said guide means secured at the wheel cover, said guide means being operable to engage in corresponding recesses of a wheel rim, the wire ring being constructed as prestressed bending spring and having in the unstressed condition a non-circular circumference formed by more than one ring section, some of the sections being coordinated one to each of the guide means with the remaining sections disposed therebetween, and the bending spring attaining a shape at least approximating a circle after being clamped into the guide means of the wheel cover and after mounting of the wheel cover on the wheel rim.

4,603,916

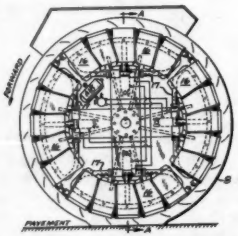
LIGHTWEIGHT RETRACTABLE TRACK-WHEEL FOR AGRICULTURAL TRACTORS AND THE LIKE

Thorvald G. Granryd, 1260 N. Western Ave., Lake Forest, Ill. 60045

Filed Nov. 2, 1984, Ser. No. 667,572

Int. Cl.[4] B60B *15/12, 15/06;* A01B *33/02, 63/02*

U.S. Cl. 301—45 18 Claims



1. A retractable drive system for a rubber tired vehicle having a power driven tire and a driving member for the power driven tire, said retractable drive system comprising

a frame having a first disc member, a second plate member and a hub operatively connected to said first and second members to form a rigid structure,

said hub being adapted to be secured to a driving member of a power driven wheel,

said first member including at least two series of anchor means for forming points of securement,

said second member including at least two pivot means for forming a pivotal connection,

at least two drive propulsion assemblies, each of said assemblies including a length of wire rope,

said wire rope being mounted upon one of said at least two series of anchor means for rotational movement relative thereto,

said drive propulsion assemblies also including a supporting member, said supporting member being mounted upon one of said at least two pivot means for rotational movement relative thereto,

said drive propulsion assemblies further including a series of ground engaging spades mounted on said length of wire rope in a position to be movable between ground engaging and ground avoiding contact, each of said ground engaging spades having a lug portion, a base portion, a mounting portion and an end portion,

coupling means for fixedly securing said mounting portion of each of said ground engaging spades onto said length of wire rope such that rotational movement of said wire rope will move said ground engaging spades between said ground engaging and ground avoiding contact, and

actuating means for applying and retracting said series of ground engaging spades of said at least two drive propulsion assemblies.

4,603,917

HYDRAULIC PRESSURE CONTROL VALVE FOR DUAL BRAKE CIRCUIT

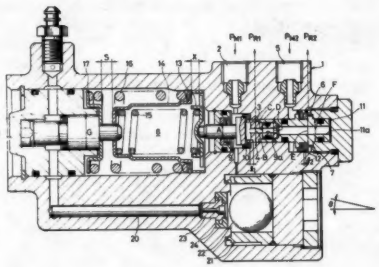
Teruhisa Kohno, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 26, 1984, Ser. No. 624,863

Claims priority, application Japan, Jul. 1, 1983, 58-120878

Int. Cl.[4] B60T *8/26, 17/18*

U.S. Cl. 303—6 C 4 Claims



1. In a fluid pressure controlling valve for a dual path brake system including a pressure reducing valve for outputting an input fluid pressure of a first fluid system and a follower valve connected in series with said pressure reducing valve for outputting a fluid pressure of a second fluid system substantially equal to that of said first fluid system and following said output fluid pressure of said first fluid system, said follower valve having a first pressure receiving portion receiving the fluid pressure of said first fluid system in a valve opening direction and a second pressure receiving portion for receiving an output fluid pressure of said second fluid system in a valve closing direction and having an area equal to that of said first pressure receiving portion, the improvement wherein said follower valve comprises a fluid pressure responsive plunger having a central passage formed therethrough, said fluid pressure responsive plunger having an annular portion functioning as said first pressure receiving portion, and a valve head provided centrally of said plunger, an annular valve seat disposed around said fluid pressure responsive plunger and being adapted to provide selected fluid communication between an

inlet of said second fluid system and an output of said second fluid system by selective contact with said valve head, a third pressure receiving portion being provided at a stepped portion defined between said first pressure receiving portion and said valve head, for applying the input pressure of said second system in the valve opening direction of said follower valve, said follower valve having an end portion constituting a fourth pressure receiving portion for receiving the input pressure of said first fluid system via said central passage, and said second pressure receiving portion being provided at a second stepped portion defined between said valve head and said fourth pressure receiving portion for applying the output pressure of said second fluid system in the valve closing direction of said follower valve, said pressure receiving areas of said first, second, third and fourth pressure receiving portions being such that $a=b$, $c=d$, and $b \leqq c$, where a, b, c and d represent the pressure receiving areas of said first, second, third and fourth receiving portions, respectively.

4,603,918

HYDRAULIC DUAL-CIRCUIT TANDEM MASTER BRAKE CYLINDER

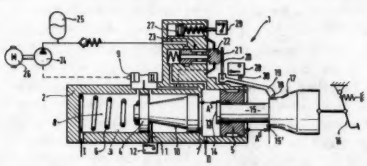
Heinz Leiber, Oberriexingen, and Hannes Bertling, Vaihingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 375,899, May 7, 1982, abandoned. This application Dec. 19, 1984, Ser. No. 682,824

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150120; Mar. 24, 1982, 3210735

Int. Cl.⁴ B60T *8/02, 11/20, 13/14*

U.S. Cl. 303—6 R **5 Claims**



1. A hydraulic dual-circuit tandem master brake cylinder for vehicle brake systems having a closed brake circuit and an open brake circuit, the closed brake circuit including: a brake piston which serves to pressurize said closed brake circuit, and the open brake circuit including: a main brake cylinder, an annular piston member in said brake cylinder, and a foot actuated pedal push rod, said foot-actuated pedal push rod including a small diameter portion that extends through said annular piston member and extends into a fluid pressure chamber for said open brake circuit, a larger diameter portion that includes a control contour surface and which includes a frontal shoulder on the pedal side of said annular piston member between said annular piston and said control contour surface, and a brake-pressure-generating piston end face in said chamber which is larger than said small diameter portion of said pedal push rod, said annular piston member and said piston end face of said pedal push rod forming a rear wall in said fluid pressure chamber, a slide control valve means actuated by said control contour surface of said larger diameter portion of said pedal push rod, and said pedal push rod actuates said annular piston member in said open brake circuit and said brake piston in said closed brake circuit in the event of a pressure failure.

4,603,919

DUAL CONTROL PRESSURE MEDIUM BRAKE SYSTEM

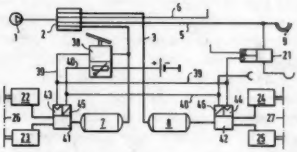
Ingolf Grauel, Vaihingen/Enz; Günter Kulke, Esslingen; Egbert Müller, Hochdorf, and Werner Stumpe, Kornwestheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 415,614

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1981, 3144961

Int. Cl.⁴ B60T *15/18*

U.S. Cl. 303—6 R **5 Claims**



1. A dual control pressure-medium brake system including at least two brake circuits, a pressure-medium source for each brake circuit, a dual control valve in each brake circuit which controls a pressure medium flow through a pressure medium control chamber for each brake circuit, each separate dual control valve comprising at least two control chambers, a control medium directed to each of said at least two control chambers to control said pressure medium in each brake circuit when the brakes are activated, each of said at least two control chambers of said dual control valves are controlled with control media from different brake circuits.

4,603,920

HYDRAULIC PRESSURE CONTROL DEVICE FOR USE IN VEHICLE ANTI-SKID BRAKING SYSTEM

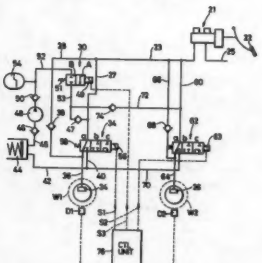
Hiromi Otsuki; Ryoichi Matsuura; Hiroshi Fujinami; Shinichi Hori, all of Anjo; Yoshihisa Nomura, Toyota, and Hiroyuki Oka, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 2, 1984, Ser. No. 667,221

Claims priority, application Japan, Nov. 4, 1983, 58-208026

Int. Cl.⁴ B60T *8/02*

U.S. Cl. 303—10 **4 Claims**



1. A hydraulic pressure control device in a vehicle anti-skid braking system, comprising:

(a) a brake master cylinder operable for producing a fluid pressure;

(b) wheel brake actuating cylinder means for applying a braking force dependent on said fluid pressure to a wheel;

(c) fluid pressure supply passage means connected between

said brake master cylinder and said wheel brake actuating cylinder means;

(d) directional control valve means disposed in said fluid pressure supply passage means for supplying the fluid pressure from said brake master cylinder to said wheel brake actuating cylinder means in a pressure-increasing braking mode and for disconnecting said wheel brake actuating cylinder means from said brake master cylinder and guiding the fluid pressure from said wheel brake actuating cylinder means to an outlet of the directional control valve means to reduce the braking force on said wheel in a pressure-decreasing anti-skid control mode;

(e) control means for generating a command signal in response to deceleration of said wheel as it is braked in the normal braking mode and applying said command signal to said directional control valve means to initiate the pressure-decreasing anti-skid control mode;

(f) reservoir means connected to said outlet of the directional control valve means for temporarily storing the fluid pressure from said outlet as a low-pressure fluid in said pressure-decreasing anti-skid control mode;

(g) fluid pressure pump means connected to said reservoir means for pumping the low-pressure fluid from said reservoir means as a high-pressure fluid;

(h) accumulator means connected to said fluid pressure pump means for accumulating the high-pressure fluid from said fluid pressure pump means; and

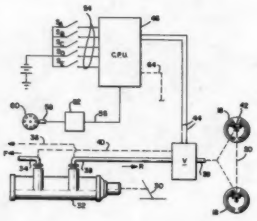
(i) solenoid-operated pressure control valve means connected between said accumulator means and said fluid pressure supply passage means coupled to an inlet of said directional control valve means, said solenoid-operated pressure control valve means being shiftable under the control of said generating control means between a closed position to cut off communication between said accumulator means and said fluid pressure supply passage means when said directional control valve means is in said pressure-decreasing anti-skid control mode and an open position to allow the high-pressure fluid to be supplied from said accumulator means to said directional control valve means when the directional control valve means enters from said pressure-decreasing anti-skid control mode into said pressure-increasing braking mode.

4,603,921

BRAKE PROPORTIONING SYSTEM

John V. Liggett, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 6, 1985, Ser. No. 741,646
Int. Cl.[4] B60T *13/00, 8/18*
U.S. Cl. 303—6 C **7 Claims**



1. A process of proportioning multi-axle brake efforts for a passenger vehicle having a driver seat, one or more passenger seat or seats and a load-carrying space, wherein the brake effort on at least one axle is proportioned in predetermined relationship with respect to the brake effort on at least one other axle of the vehicle, comprising:

(a) sensing the presence of loads exceeding a selected threshold at at least the passenger and luggage-carrying space locations of the vehicle and generating electrical load presence signals representative of each such presence;

(b) processing said load presence signals to drive a predetermined finite number of brake proportion control signals corresponding to a predetermined number of brake proportion settings depending upon the location and number of the sensed load presences;

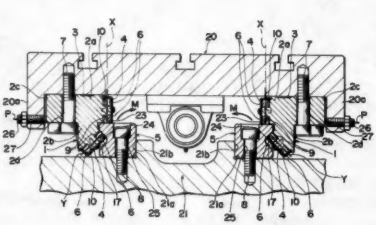
(c) transmitting said brake proportion control signals to an electrically controlled brake proportion means in the brake operating circuit of the vehicle to thereby regulate the proportional effort applied by the brakes on different vehicles axles in response to brake effort applied by a vehicle operator.

4,603,922

ROLLER BEARING FOR LINEAR SLIDING MOVEMENT

Hiroshi Teramachi, 34-8, Higashitamagawa 2-chome, Setagaya-ku, Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,865
Claims priority, application Japan, Oct. 27, 1984, 59-226595
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—44 **2 Claims**



1. A roller bearing for linear sliding movement comprising a sliding block having a horizontal portion and a suspending portion suspended from the base end thereof and formed with a loading groove and a non-loading groove constituting a loading area and a non-loading area of an infinate roller track way respectively at the top end of the horizontal portion and at the lower end of the suspending portion, a pair of roller guides mounted at the top end of the horizontal portion and at the lower end of the suspending portion of said sliding block respectively and constitute the infinate roller track in combination with said loading groove and non-loading groove formed at the top end of the horizontal portion and at the lower end of the suspending portion, a raceway block having upper and side rolling faces opposing to the respective loading grooves formed at the top end of the horizontal portion and at the lower end of the suspending portion of said sliding block and a plurality of rollers circulating through each of the infinite roller track formed at the top end of the horizontal portion and at the lower end of the suspending portion of said sliding block in combination with said roller guides and receiving the load between each of the loading grooves on the side of the sliding block and each of the rolling faces on the side of the raceway block, in which said raceway block is perforated with mounting holes through which fixing bolts are passed and formed with said upper rolling face and the side rolling face relative to the mounting hole generally is perpendicular to the upper surface of the horizontal portion, a load acting line extended between the upper rolling face and the loading groove formed at the top end of the horizontal portion of the sliding block is directed in perpendicular to the upper surface of said horizontal portion, while another load acting line extended between the side rolling face and the loading groove formed at the lower end of the suspending portion of said sliding block opposing to the side roller face is slanted upwardly relative to the vertical line in perpendicualr to the upper surface of said horizontal portion and, upon fixing the sliding block to a movable body, preloading is applied by exerting an urging force from

the side of the movable body to the side of the horizontal portion.

4,603,923

INNER RACE FOR A SWASHPLATE MECHANISM

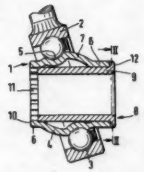
Horst Döppling; Steffen Hertrich; Walter Pöschl; Joachim Ritter, and Karl Sill, all of Herzogenaurach, Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,603

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1984, 3400635

Int. Cl.[4] F16C *31/04*

U.S. Cl. 384—7 10 Claims



1. In a swashplate mechanism comprising an inner race having on its outer surface a ball groove extending at an angle to its longitudinal axis and an outer race surrounding the inner race and having a ball groove in its bore and a ring of balls rolling in the grooves of the inner and outer races, the improvement comprising the inner race is formed as a tubular sheet-metal element with a ball groove formed without metal removal, the sheet-metal element having substantially constant wall-thickness over its entire length, and being smaller at its two end portions than at its central portion, the inner race being provided with a hub bush in its bore to receive a shaft, the hub bush being connected to the sheet-metal element in the area of its end portions, the hub bush having a radially outwardly extending flange at least at one end bearing against the end face of the sheet-metal element.

4,603,924

MULTIPLE STRIP SUPPORT FOR WIRE MARKING ELEMENTS TO BE APPLIED ON CABLES AND TERMINALS

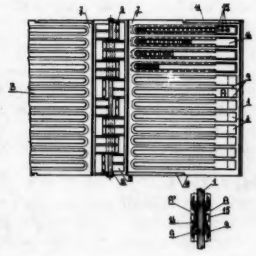
Ivana Piana, and Silvano Piana, both of Genoa, Italy, assignors to Grafoplast S.p.A., Italy

Filed May 29, 1984, Ser. No. 614,820

Claims priority, application Italy, Jul. 23, 1983, 12587 A/83

Int. Cl.[4] A47B *97/02;* G09F *3/00*

U.S. Cl. 312—183 6 Claims



1. A support for multiple strips, comprising a casing having identical upper and lower faces with transverse grooves and hole means therein, lug means on at least one side of said casing and forming female hinge parts, and wall means covering each face of said casing, said wall means each having a plurality of transverse webs forming a plurality of slits therebetween, said webs having a T-section along part of their length and a square section along another part of their length, said webs extending into said grooves, said wall means having pin means arranged to enter said hole means to obtain registry of said wall means with its associated casing, said female hinge parts of one casing being operable to cooperate with said female hinge parts of another said casing to hingedly connect one said casing to another said casing.

4,603,925

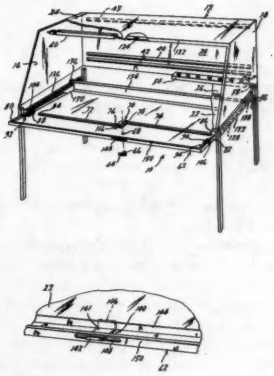
PERSONAL COMPUTER STORAGE CABINET

Pablo Cuevas-Cumming, Walled Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 25, 1985, Ser. No. 758,943

Int. Cl.[4] A47B *17/00;* E05D *15/58*

U.S. Cl. 312—196 4 Claims

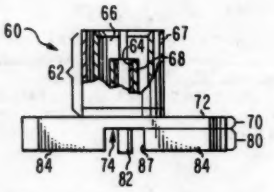


1. A personal computer storage cabinet comprising a cabinet portion having side panels, a back panel, a bottom panel and a top panel defining an enclosed storage space having a front access opening for personal computer equipment, a retractable door movable from a closed position in which it covers the access opening to an open position stored beneath the cabinet portion in which it uncovers the access opening to permit operation of personal computer equipment stored within the cabinet, said door having an upper edge and a lower edge, a pinion rotably mounted on each end of the lower door edge, an elongated gear rack mounted under each pinion beneath, and spaced from, the cabinet bottom panel, each of said gear racks being in engagement with its respective pinion and extending from the front to the rear of the cabinet portion, said door being pivotable about the pinions and movable by means of said pinions in the gear racks to its open and closed positions, support means provided on the cabinet portion to engage the door for retaining the door in its open position, and locking means on the door adjacent the upper edge thereof cooperating with engagement means on the cabinet portion for locking the door in its closed position, said support means on the cabinet portion comprising a bracket secured to the underside of the cabinet portion, said bracket including a portion extending forwardly of the cabinet portion and terminating in an upturned end portion, said retractable door having a flange on the upper edge, said flange having opening means to receive said forwardly extending bracket portion to support the upper edge of the door when the door is moved to its open position stored beneath the cabinet portion, said upturned end portion of the bracket preventing inadvertent release of the door.

4,603,926
CONNECTOR FOR JOINING MICROSTRIP TRANSMISSION LINES

Gerald H. Nesbit, Voorhees Township, Camden County, and Alireza Afrashteh, Colts-Neck, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 29, 1983, Ser. No. 566,905
Int. Cl.[4] H05K *1/00*
U.S. Cl. 339—17 C 12 Claims



1. A connector half for coupling microwave signals between a mating coaxial connector half and a strip transmission line of the type having a dielectric substrate with a relatively narrow strip conductor on a face side thereof and a relatively broad ground conductor on a back side thereof, said connector half comprising:

a body portion having a conductive outer portion and an aperture therethrough;

a coaxial connector portion adjacent to one side of said body portion, said coaxial connector portion including a linear inner conductor and an outer conductor which is electrically continuous with said conductive outer portion;

said linear inner conductor extending linearly from within said coaxial connector portion through said aperture and beyond said body portion without contacting said conductive outer portion for making electrical contact with said narrow strip conductor on said substrate, when said connector half is mounted on said face side of said strip transmission line substrate; and

a stand-off portion adjacent to a second, opposite, side of said body portion for, when positioned over said strip transmission line, spacing said body portion a predetermined distance from said strip transmission line substrate, said stand-off portion being configured with a gap through which said inner conductor extends and within which said relatively narrow strip conductor mat, while spaced from said stand-off portion, extend between said body portion and said strip transmission line substrate to be in electrical contact with said inner conductor, said stand-off portion of a material and configured in the region about said gap to form an intermediate RF transmission line with said linear extension of said inner conductor to match the characteristic impedance of said coaxial connector portion and the characteristic impedance of said strip transmission line structure;

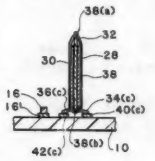
said body portion and said stand-off portion together configured to provide an electrical connection between said outer conductor and said relatively broad ground conductor, when said connector half is mounted on said face side of said strip transmission line substrate;

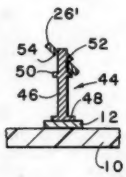
said stand-off portion including an electrically conductive surface bordering a portion of said gap and extending from said body portion for substantially said predetermined distance, said electrically conductive surface being serpentine and including a central portion which is concave toward said inner conductor and end portions which are convex toward said inner conductor.

4,603,927
SURFACE MOUNTED BUSSING DEVICE

John R. Gardner, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Jul. 12, 1984, Ser. No. 630,027
Int. Cl.[4] H01R *9/09, 31/08*
U.S. Cl. 339—17 C 10 Claims





6. An apparatus for mounting electrical components on a circuit board comprising:

electrically conductive stud means, said stud means including mounting means adapted to be mounted on connection pads located at the surface of a circuit board to effect electrical and mechanical connection therewith;

said stud means including means to electrically and mechanically mount an electrical component thereon;

said stud means including;

a base portion, said base portion being electrically and mechanically mountable on said connection pads of said circuit board; and

a substantially vertical stem portion extending from said base portion;

and wherein said electrical component includes at least one mounting hole therethrough and wherein said stud means mounting means includes;

a substantially horizontal cross member disposed on said stem portion; and

latch means disposed on said stem portion and spaced from said cross member;

said stem portion communicating through said mounting holes wherein said latch means effects a snap fit with said electrical component.

4,603,928
BOARD TO BOARD EDGE CONNECTOR

William R. Evans, Mooresville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

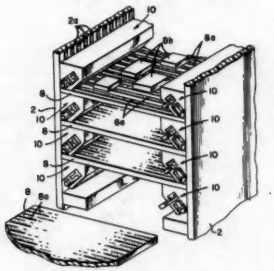
Filed Mar. 20, 1985, Ser. No. 713,970
Int. Cl.[4] H01R *9/09, 13/63.5*
U.S. Cl. 339—17 LM 13 Claims

2. A board to board connector apparatus for interconnecting discrete electrically conductive paths on a mother board to corresponding electrically conductive paths on a daughter board; comprising:

a laterally disposed resilient connecting element having discrete laterally disposed electrically conductive paths on the exterior thereof disposable in opposition to corresponding electrically conductive paths on both the mother and the daughter boards;

a longitudinally extending housing attachable to one of the mother and daughter boards and having an opening at one of its longitudinally spaced ends: and

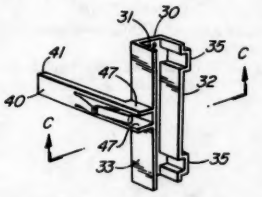
at least two camming members relatively mutually longitudinally shiftable and longitudinally insertable into the housing through the opening, with the resilient connecting element being affixed to one camming member, relative longitudinal movement between the two camming elements imparting transverse movement of the connecting element and the one camming substantially perpendicular to the longitudinal extent of the housing toward both the mother and daughter boards bringing the discrete conductive paths on the connecting element into surface contact with the corresponding discrete conductive paths on the mother and daughter boards.



4,603,929
CONNECTOR SHROUD

Michael H. Fitzpatrick, Sunnyvale, Calif., assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 13, 1985, Ser. No. 701,286
Int. Cl.[4] H05K *1/00*
U.S. Cl. 339—17 C **13 Claims**



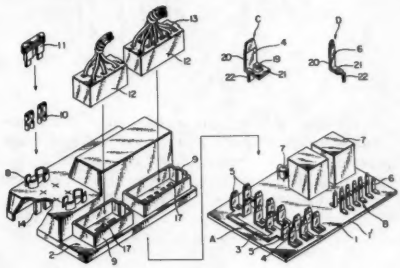
3. A connector shroud for assembly with a plurality of elongated connector elements being anchored in a circuit board back plane and protruding beyond back and front surfaces of the back plane in a pattern for coupling with female connectors, the connector shroud comprising, a base including a flat body including side and end portions and a plurality of apertures extending therethrough, the apertures being arranged in said pattern for accepting the elongated connector elements, a keyway being defined in a side wall extending from one of the side portions normal to the flat body portion, the keyway being for mating with a complementary keying formation in a first female connector to permit discriminatory coupling with the elongated connector elements adjacent one surface of the back plane, the connector shroud being characterized by:

a key member extending normal to the flat body portion in a direction opposite to that of the side wall, in assembly the key member extending through an opening in the circuit board back plane and being for cooperating with a complementary keying structure associated with a second female connector different from said first female connector to permit discriminatory coupling of the elongated connector elements adjacent another surface of the back plane.

4,603,930
INTERCONNECTION APPARATUS FOR WIRING HARNESSES

Mitsuru Ito, Kuwana, Japan, assignor to Tokai Electric Wire Company Limited and Sumitomo Electric Industries Ltd., both of, Japan

Filed Jul. 2, 1984, Ser. No. 626,695
Claims priority, application Japan, Jul. 5, 1983, 58-122642
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—17 R **6 Claims**



1. In an interconnection apparatus for wiring harnesses including a wiring board including a single-layer insulating board and a cover fitted over the wiring board to cover the same, the improvement wherein said wiring board comprises branch conductive path means formed by a busbar mounted on said insulating board and having a predetermined pattern including a plurality of tab contact members adapted to be connected to branch circuit means of the wiring harness, functional component circuit means formed by a plurality of functional components mounted on said insulating board and positioned on said wiring board to be fitted within the periphery of said cover, and printed wiring circuit means formed on said insulating board and interconnecting said branch conductive path means and said functional componenent circuit means, each of said tab contact members being formed into an L-shape and having a first leg extending parallel to said insulating board and in circuit with said printed wiring circuit means and a second terminal leg extending perpendicularly to said wiring board, said cover including a plurality of press pieces disposed to engage said first legs of said L-shaped tab contact members and restrain them relative to the insulating board to restrain them upon removal of an attached connector.

4,603,931
ANTI-THEFT DEVICE FOR APPLIANCES WITH ELECTRICAL AC POWER CORDS

Samuel H. Ruffman, 1800 Selby Ave., #2, West Los Angeles, Calif. 90025

Filed Dec. 14, 1984, Ser. No. 681,599
Int. Cl.[4] H01R *13/44*
U.S. Cl. 339—37 **17 Claims**

1. Anti-theft device for securing a power plug against removal from an electrical power outlet comprising:

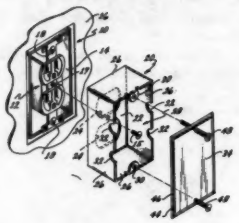
an enclosure of electrically conductive material having a face plate wall apertured to allow insertion of at least one power plug into an electrical power outlet covered by said face plate wall, a plurality of side walls, and an open side;

means for securing said face plate wall over an electrical power outlet;

a cover for closing said open side;

means for fastening said cover to said enlosure; and

one or more openings defined between said cover and at least one of the side walls, each said opening being dimensioned to allow passage of an electrical power cord but to prevent passage of a power plug attached to the cord within the enclosure, each said opening being defined by



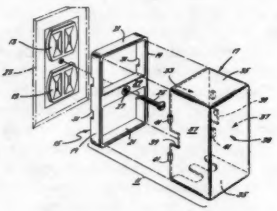
unprotected relatively sharp edges so as to cut into the electrical insulation of a power cord passing through the opening upon attempted forced removal of the power plug from the enlosure and thereby create a short circuit to deter theft.

4,603,932

ELECTRICAL OUTLET COVER

Karen H. Heverly, 894 Village Cir., Blue Bell, Pa. 19422

Filed Jan. 10, 1985, Ser. No. 690,299
Int. Cl.[4] H01R *13/44*
U.S. Cl. 339—39 **9 Claims**



1. A protective covering for an electrical outlet having plug receptacles and a cover plate and screw, comprising:

a box-like cover positionable over said outlet plug receptacles which includes a rectangular box haivng an open face, closed top, bottom and side faces and a closed outer face, said open face being positionable to seat over said plug receptacles and said top, bottom and side faces being of a size to fit neatly within said rectangular frame dimensions:

a rectangular frame seatable against, and attached to, said cover plate having a center rib, said rib being positionable over the cover plate screw position;

a hole through said center rib in alignment with the cover plate screw hole when said frame is positioned over said plug receptacles;

a plurality of cutout openings in said frame; and

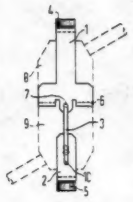
a plurality of outwardly protruding tabs on said side faces for holding said box-like cover against said frame being in position to extend into said side face cutout openings when said box is positioned within said frame wherein each side face of said rectangular box contains a cutout opening of a size and position to permit each said side face to fit over said center rib when said rectangular box is positioned within said frame.

4,603,933

PLUG COUPLING HAVING PLUG PROTECTION

Leopold Hoer, Augsburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 697,029
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407446
Int. Cl.[4] H01R *13/639*
U.S. Cl. 339—75 P **5 Claims**



1. A plug coupler for preventing undesired disconnection of first and second connector parts, comprising:

a first U-shaped part for embracing the first connector part and including a base, a first locking screw extending through said base and a pair of legs extending from said base;

a pair of hook members each including a first end hook section pivotally connected to a respective leg and a second end hook section; and

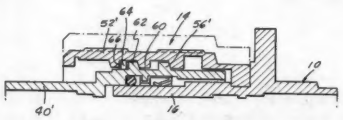
a second U-shaped part for embracing the second connector part and including a base, a second locking screw extending through said base and a pair of legs extending from said base and connected to said second end hook sections.

4,603,934

FACE SEAL PRESSURE APPARATUS FOR ELECTRICAL CONNECTORS

Edgar Burns, Los Angeles, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Apr. 15, 1985, Ser. No. 723,192
Int. Cl.[4] H01R *13/625*
U.S. Cl. 339—90 R **9 Claims**



1. An electrical connector comprising:

a receptacle portion;

a plug portion adapted to mate with the receptacle portion;

each of the plug receptacle portions having aligned mating contact members positioned on a mating face located on the respective plug portion and receptacle portion;

a locking ring surrounding the plug portion and receptacle portion and having a threaded interiorly facing surface;

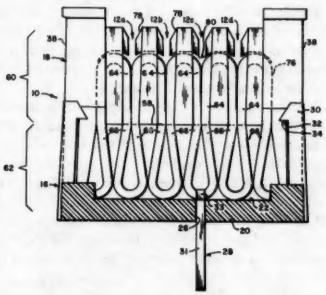
a threaded exteriorly facing surface on the one of the plug and receptacle portions positioned adjacent the locking ring, to move the plug portion and receptacle portion into a mated position upon rotation of the locking ring in a first direction; and

a face seal biasing spring positioned between at least one thread on each of the threaded interiorly facing surface and the threaded exteriorly facing surface.

4,603,935
MULTIPLE ELECTRICAL CONNECTOR BLOCK WITH IMPROVED WIRE WRAP PINS

Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.

Filed Sep. 29, 1983, Ser. No. 537,070
Int. Cl.[4] H01R 9/00
U.S. Cl. 339—97 P 16 Claims



1. A block for housing a plurality of electrically conductive wire-formed connector elements of the type having oppositely facing and interconnected upper and lower rows of loops, the block including:

a retainer section, said retainer section having opposite first and second surfaces;

a plurality of latitudinal rows of spaced slots extending into said retainer section from said first surface;

at least some of said spaced slots of said retainer section being provided with apertures, said apertures each being positioned so as to be disposed under about the center of a lower loop of one of said wire-formed connector elements, said apertures commuicating with said retainer section second surface;

at least one elongated electrically conductive pin means, said pin means being positioned and retained within one of said apertures of said spaced slots, portions of said pin means extending outwardly beyond both of said first and second surfaces of said retainer section, said portion of said pin means extending from said first surface of said retainer section having notch means to form mechanical and electrical contact with the center of a lower loop of one of said wire-formed connector elements;

a main body section connected to said retainer section first surface.

4,603,936
ELECTRICAL CONNECTOR FOR A SHIELDED CABLE

Paul R. Jagen, Mechanicsburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1983, Ser. No. 562,967
Int. Cl.[4] H01R 13/648, 13/652
U.S. Cl. 339—143 R 5 Claims

1. A connector for a cable of the type having a plurality of conductors and a shield comprising:

a dielectric housing with an array of openings for receiving the ends of each of the conductors;

a shielding member formed of electrically conductive material in the shape of a substantially rectangular annular can, said shielding member surrounding the dielectric housing and being electrically connectable to the shield of the cable;

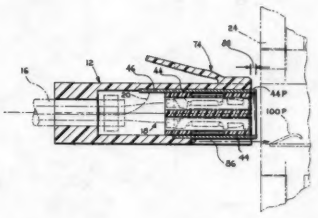
a dielectric casing surrounding the shielding member to form a plug-like terminal of a substantially rectangular cross-section shape along a major portion of its length, the interior of the casing having a substantially rectangular recess for receiving said shielding member;

a resilient latch pivotally mounted to the exterior of the casing;

a cutout formed on one surface of the dielectric casing to expose a portion of one of the annular rectangular sides of the shielding member;

a receptacle having a substantially rectangular recess for receiving the terminal, said receptacle further including a latch camming surface and an abutment surface;

a ground connection contact mounted on an inner surface within the recess of the receptacle and projecting into the volume of said recess, said ground connection contact being in a position registrable with the cutout formed in the casing when the terminal is fully inserted into the receptacle;

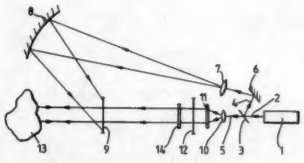


movement of the terminal into the recess of the receptacle causing the latch to engage the camming surface and to pivot with respect to the terminal casing to facilitate introduction of the terminal into the receptacle, the latch upon clearing the camming surface resiliently snapping into latched engagement against the abutment surface of the receptacle to hold the terminal in a locked position within the receptacle recess, said locked position being the position where the ground connection contact is registrable with the cutout formed in the casing so that the ground connection contact is in electrical engagement with the portion of the shielding member exposed by said cutout whereby at said locked position the shielding member portion exposed by said cutout is located entirely within the recess of the receptacle and said electrical engagement is achieved completely within the recess of the receptacle.

4,603,937
HOLOGRAPHY

James R. Copp, Braxted Park, Witham, Essex CM8 3XB, England

Filed Jun. 5, 1984, Ser. No. 616,949
Claims priority, application United Kingdom, Jun. 6, 1983, 8315427
Int. Cl.[4] G03H 1/12
U.S. Cl. 350—368 7 Claims



1. A method of producing holographs of a subject on a laser light-sensitive emulsion which includes irradiating the laser light-sensitive emulsion with a reference beam of laser light, and with an object beam of laser light reflected from a scale representation of a subject, wherein the energy distribution

across the laser light incident upon the scale representation varies in accordance with a partially transmitting optical element or elements depicting the subject from the same apparent viewpoint as the object beam irradiates the scale representation.

4,603,938

METHOD OF PRODUCING INLINE HOLOGRAM LENS

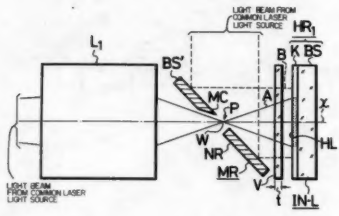
Chiaki Kojima, Yokohama; Kayoko Hasegawa, Kamakura, and Kousuke Miyahara, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP81/00332, § 371 Date Jul. 8, 1983, § 102(e) Date Jul. 8, 1983, PCT Pub. No. WO83/01845, PCT Pub. Date May 26, 1983

PCT Filed Nov. 13, 1981, Ser. No. 527,578

Int. Cl.[4] G02B *5/32, 27/14*

U.S. Cl. 350—3.72 **9 Claims**



1. A method of producing an inline hologram lens using first and second interfering wave beams from a common source comprising the steps of employing an optical lens element receiving the first wave beam for radiating a spherical wave beam therefrom, providing a full reflection mirror having a small window formed therein, irradiating said spherical wave beam through the small window of said full reflection mirror with no spherical aberration onto a hologram record medium as a subject wave beam, and, simultaneous with said subject wave beam, irradiating the second wave beam onto said hologram record medium as a reference wave beam by reflecting the second wave beam with said full reflection mirror.

4,603,939

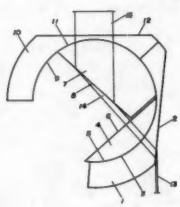
REVOLVING MAGNIFYING PRISMS

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Aug. 24, 1984, Ser. No. 643,854

Int. Cl.[4] G02B *5/04*

U.S. Cl. 350—6.4 **1 Claim**



1. Revolving magnifying prisms comprising in general a lower stage consisting of four cylindrical members which can be revolved independently of each other, each member having a planar face which either transmits or refracts a light beam projected through the prisms as means of magnifying the beam in one dimension, and comprising an upper stage consisting of four cylindrical members identical to the four members of the lower stage but revolved 90° on the vertical axis of the prisms as means of magnifying the beam in the other dimension, and each lower and upper stage comprising in particular when revolved to positions of maximum magnification;

a cylindrical member (1) comprising a longitudinal segment of a hollow cylinder having a planar face (2) which refracts an incipient beam (13), forming a refracted beam (14), and having an opposed concave cylindrical face (3) which emits said refracted beam (14),

a cylindrical member (4) comprising a longitudinal segment of a whole cylinder mounted inside said cylindrical member (1) and having a convex cylindrical face (5) adjoining said concave cylindrical face (3) so as to transmit said refracted beam (14), and having an opposed planar face (6) which emits said refracted beam (14),

a cylindrical member (7) comprising a longitudinal segment of a whole cylinder mounted inside a cylindrical member (10) and having a planar face (8) which refracts said refracted beam (14), forming a refracted beam (15), and having an opposed convex cylindrical face (11) which transmits said refracted beam (15), and

said cylindrical member (10) comprising a longitudinal segment of a hollow cylinder having a concave cylindrical face (9) adjoining said convex cylindrical face (11) so as to transmit said refracted beam (15), and having an opposed planar face (12) which emits said refracted beam (15).

4,603,940

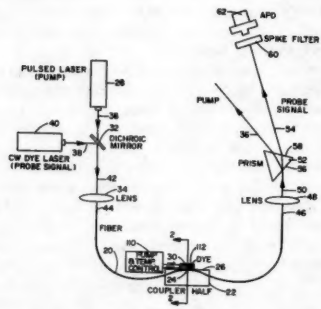
FIBER OPTIC DYE AMPLIFIER

Herbert J. Shaw, Stanford; Michel J. F. Digonnet, Palo Alto; Ralph A. Bergh, Atherton; Wayne V. Sorin, Stanford, and Brian H. Kolner, Menlo Park, all of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Aug. 30, 1983, Ser. No. 527,946

Int. Cl.[4] G02B *6/26, 6/36, 6/10*

U.S. Cl. 350—96.15 **30 Claims**



1. A light amplification apparatus for amplifying light at a first wavelength in response to optical pumping by light at a second wavelength, said amplifier comprising:

a monomode optical fiber having a core and a cladding, said fiber arcuately mounted and having a portion of said cladding removed on one side of said fiber over a predetermined region to provide a surface on said cladding which is sufficiently close to said core exclusively at said one side of said fiber to allow evanescent field penetration at said surface of light propagating in said fiber at said first and second wavelengths; and

a liquid dye solution, in communication with said surface, for exposure to the evanescent field of said light at said first and second wavelengths, said solution having a peak absorption wavelength which substantially matches said second wavelength and a peak emission wavelength which substantially matches said first wavelength, such that said solution absorbs light energy at said second

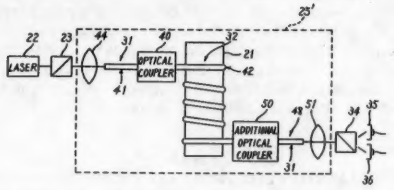
wavelength to excite dye molecule in said solution to a higher energy state, said light at said first wavelength stimulating emission of light energy by the exited dye molecules at said first wavelength to cause amplification of said light at said first wavelength.

4,603,941

POLARIZATION-MAINTAINING FIBER SYSTEM AND METHOD OF MANUFACTURING THE SAME

Yoshimasa Fujii, Tokyo; Yoshinobu Mitsuhashi, Ibaraki, and Osamu Koike, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology and Hoya Corporation, both of Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,656
Claims priority, application Japan, Sep. 27, 1982, 57-167946; Sep. 27, 1982, 57-167947; Sep. 27, 1982, 57-167948
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **13 Claims**



1. An optical fiber system comprising:

a first polarization-maintaining fiber having a first longitudinal axis, a first plane along said first longitudinal axis, and a second plane orthogonal to said first plane to define a first orthogonal coordinate system in cross section;

a second polarization-maintaining fiber having a second longitudinal axis, a third plane of polarization along said second longitudinal axis, and a fourth plane orthogonal to said third plane to define a second orthogonal coordinate system in cross section; and

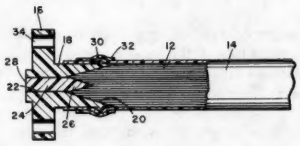
coupling means for coupling said first polarization-maintaining fiber to said second polarization-maintaining fiber with said first longitudinal axis matched to said second longitudinal axis and with said first orthogonal coordinate system azimuthally offset from said second orthogonal coordinate system.

4,603,942

FLEXIBLE, DIELECTRIC MILLIMETER WAVEGUIDE

Yu-Wen Chang, Rancho Palos Verdes; Phillip T. Kan, Fullerton, and Oakley G. Ross, Upland, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Oct. 11, 1983, Ser. No. 540,479
Int. Cl.[4] G02B *5/14*
U.S. Cl. 350—96.24 **13 Claims**



6. A flexible dielectric millimeter waveguide comprising:

a flexible cable comprising:

a flexible sheath, and

a plurality of flexible fibers of dielectric material encased within said sheath; and

a termination flange connected to at least one end of said cable, said termination flange comprising:

a rigid body member having a generally circular radial flange portion and a generally cylindrical extension portion extending coaxially from said flange portion, said body member having a generally cylindrical bore extending coaxially through said flange portion and said extension portion, said bore terminating in said extension portion at an end opposite said flange portion is a generally conical-shaped opening, said extension portion having a radial ridge about the exterior thereof adjacent said end with said conical-shaped opening;

a generally cylindrical plug having one end flush with said flange portion and an opposite end being conical-shaped and extending within the region defined by said conical-shaped opening, said plurality of fibers abutting said conical-shaped end of said plug and said conical-shaped opening, said sheath extending about the exterior of said extension portion between said ridge and said flange portion; and

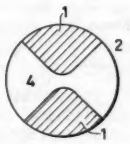
a collar mounted about said sheath overlapping said ridge, said collar securely engaging said sheath with said ridge and extension portion.

4,603,943

STRUCTURE OF AN OPTICAL FIBER

Takanori Okoshi, Tokyo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 6, 1983, Ser. No. 511,356
Claims priority, application Japan, Jul. 6, 1982, 57-117408
Int. Cl.[4] G02B *6/10, 6/16*
U.S. Cl. 350—96.30 **3 Claims**



1. An optical fiber having a central axis comprising a central core having a first refractive index positioned on said axis, a cladding having a second refractive index lower than said first refractive index surrounding said core, and tunnel means extending parallel to the axis of said fiber comprised of two portions disposed on opposite sides of said core between said core and said cladding.

4,603,944

OPTICAL DEVICE FOR AN INDIVIDUAL

John W. Greenlaw, Walnut Creek; Gary R. Schlueter, Castro Valley, and Karsten Kettlitz, San Leandro, all of Calif., assignors to Karsten Kettlitz, San Leandro and Gary Schlueter, Castro Valley, both of, Calif.

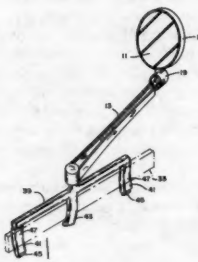
Filed Aug. 27, 1984, Ser. No. 644,529
Int. Cl.[4] G02B *7/02, 7/18*
U.S. Cl. 350—252 **7 Claims**

1. An optical device for an individual comprising

an extension bar having a holder for an optical glass mounted at one end thereof with an optical glass mounted therein,

an adjustable connection between said extension bar and said optical glass holder including a ball formed on the end of said bar, a receptacle formed on the peripheral edge of said holder, and a socket formed to encapsulate at least a portion of the ball formed on said bar and to fit within the receptacle formed in said holder in captured relation

thereof, said socket including a rounded internal configuration to mate with the ball on said bar and slots formed in the longitudinal sides of said socket extending from the open end thereof to permit the sides of said socket to expand when the ball on said bar is pushed into said socket, the external configuration of said socket being formed to mate and fit snugly within the receptacle on said holder, said receptacle including a retaining lip formed adjacent to the internal peripheral edge thereof for retaining said socket in said receptacle after said socket has been pushed into said receptacle beyond said retaining lip,



a second adjustable connection on said extension bar similar to the one interconnecting said optical glass holder to said extension bar, said second adjustable connection disposed at the opposite end of the extension bar from said ball, swivel post axes of the adjustable connections being disposed at right angles to each other,

means engaged with the second adjustable connection for securing the end of said extension bar opposite from said optical glass holder to a support member worn on the head of a wearer.

4,603,945

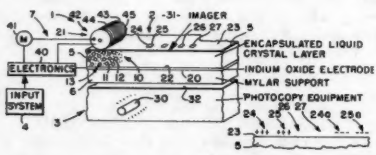
LIQUID CRYSTAL GRAPHICS IMAGER AND METHOD

James L. Fergason, Atherton, Calif., assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Filed Mar. 2, 1984, Ser. No. 585,884

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—331 R **49 Claims**



1. An imager, comprising:

liquid crystal means having an alterable optical function for affecting the transmission, scattering or absorption of light incident thereon.

support means for supporting said liquid crystal means in sheet-like layout,

said liquid crystal means being responsive to a prescribed input to alter such optical function to form characteristics of an image, such prescribed input comprising an electric field,

input means for selectively applying such prescribed input to respective portions of said liquid crystal means, and

said liquid crystal means having a memory function for temporarily storing such characteristics after termination of a direct input thereto by said input means, said memory function comprising charge storage.

15. An image copying apparatus comprising:

copier means for copying an image, and

image means for forming characteristics of such image, including

image forming and storing means for forming in real time characteristics of an image in response to a prescribed input and for temporarily storing such characteristics for a time adequate for said copier means to copy the same, such prescribed input comprising an electric field, and

scanning means for scanning said image forming and storing means to apply such characteristics thereto,

said image forming and storing means having charge storage capability to provide memory to store such characteristics,

said copier means to make a copy of an image represented by the characteristics formed and stored by the image forming and storing means.

49. An image forming method comprising applying respective charge inputs to selected areas of a sheet-like liquid crystal material, storing such applied charge inputs by such sheet-like liquid crystal material, and using such stored charge to affect the transmission, scattering or absorption of incident light thereby to form characteristics of an image.

4,603,946

REFLECTION CONTROLLABLE VIEW MIRROR DEVICE FOR MOTOR VEHICLE OR THE LIKE

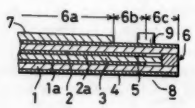
Shigeru Kato; Junichi Nakaho, and Makoto Shibahara, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

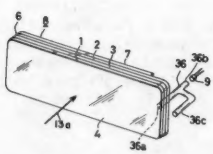
Filed Sep. 22, 1983, Ser. No. 534,604

Claims priority, application Japan, Sep. 29, 1982, 57-147510[U]; Sep. 30, 1982, 57-149940[U]; Apr. 30, 1983, 58-66626[U]; Apr. 30, 1983, 58-66625[U]; May 18, 1983, 58-74960[U]

Int. Cl.[4] G02F *1/13;* G02B *5/08*

U.S. Cl. 350—331 R **5 Claims**





1. A reflection controllable rear view mirror device having an electro-optical means, the transmittance of which varies in accordance with voltage applied thereto to change a quantity of light passing therethrough, and a mirror means mounted on the electro-optical means for reflecting said light, comprising:

(A) a photo-sensitive means for simultaneously receiving both light passing through the electro-optical means and light, the quantity of which is not varied by the electro-optical means,

said photo-sensitive means producing electric signals, the magnitude of which signals correspond with the summation of the light passing through the electro-optical

means and the light, the quantity of which is not varied by the electro-optical means, and

(B) a control circuit for controlling voltage applied to the electro-optical means so that the magnitude of the electric signals produced by the photo-sensitive means may become equal to a predetermined value.

4,603,947

INDICATING DEVICE HAVING SPACER ELEMENT DISTRIBUTION TO COMPENSATE FOR EXPANSION

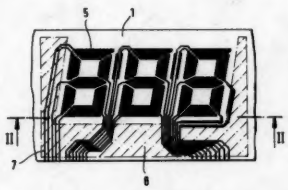
Holm Baeger, Schwalbach, and Bernd Preiss, Hofheim, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 581,770

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307333

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—344 **11 Claims**



1. In an indicating device, particularly a liquid crystal display, having a fluid which can be switched between two optically different states and which fills a cell chamber formed between two transparent support plates which are parallel to each other, the support plates being held at a predetermined distance apart by a plurality of spacer elements of given size, and the support plates being each provided with an electrically conductive layer, which layers are located opposite each other, the improvement wherein

said spacer elements are dispersed about a part of said chamber and being omitted from the remainder of said chamber, thereby permitting the volume of the cell chamber to be variable corresponding to a temperature-dependent change in the volume of the fluid contained therein.

3. In an indicating device, particularly a liquid crystal display, having a fluid which can be switched between two optically different states and which fills a cell chamber formed between two transparent support plates which are parallel to each other, the support plates being held at a predetermined distance apart by a plurality of spacer elements of given size, and the support plates being each provided with an electrically conductive layer, which layers are located opposite each other, the improvement wherein

the volume of the cell chamber is variable corresponding to a temperature-dependent change in the volume of the fluid contained therein,

the optically switchable fluid has a temperature coefficient of expansion, and the material of which the spacer elements is made has a temperature coefficient of expansion which is approximately the same as the temperature coefficient of the optically switchable fluid.

4,603,948

LARGE-APERTURE WIDE-ANGLE ZOOM LENS SYSTEM

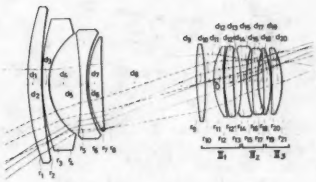
Toshihiro Imai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,116

Claims priority, application Japan, Jan. 18, 1983, 58-5290; Aug. 3, 1983, 58-141141

Int. Cl.⁴ G02B *13/04, 15/14*

U.S. Cl. 350—426 **16 Claims**



1. A large-aperture wide-angle zoom lens system comprising a front diverging lens group and a rear converging lens group, and adapted for zooming by varying an airspace reserved between said front diverging lens group and said rear converging lens group having a positive meniscus lens component on the foremost position wherein the object side surface is convex, said converging lens group being composed of a first positive subgroup comprising at least two positive lens components, a second negative subgroup comprising at least two negative lens components and a third positive subgroup comprising at least two positive lens components, said large-aperture wide-angle zoom lens system satisfying the following conditions (1) through (4):

$$0.1 < K < 0.6 \left(K = \frac{r_2 - r_1}{r_1 + r_2} \right) \quad (1)$$

$$0.12 < \frac{D}{f_R} < 0.3 \quad (2)$$

$$0.8 < \frac{r_{17}}{f_w} < 1.8 \quad (3)$$

$$0.6 < \frac{r_{15}}{r_{17}} < 1.5 \quad (4)$$

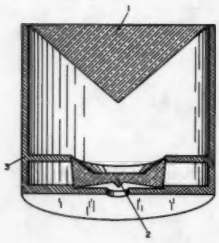
wherein the reference symbols r_1 and r_2 represent radii of curvature on both the surfaces of the positive meniscus lens component arranged on the object side in said front diverging lens group, the reference symbol r_{15} designates radius of curvature on the image side surface of the lens component arranged on the object side in the second subgroup of said rear converging lens group, the reference symbol r_{17} denotes radius of curvature on the image side surface of the lens component arranged on the image side in the second subgroup of said rear converging lens group, the reference symbol D represents thickness of the lens component arranged on the image side in the first subgroup of said rear converging lens group, the reference symbol f_R designates focal length of said rear lens group and the reference symbol f_w denotes focal length of the zoom lens system as a whole at its wide position.

4,603,949

CONICAL BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Oct. 2, 1984, Ser. No. 657,093
Int. Cl.[4] G02B *13/18, 17/08*
U.S. Cl. 350—432 1 Claim



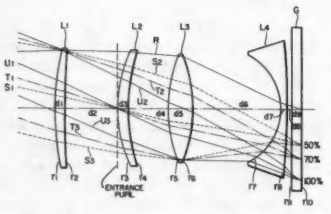
1. A conical beam concentrator LRLT-RT:C comprising;
an upper component lens RT having a planar section which receives and transmits into said upper component lens a circular whole incipient beam, and having a convex conical section which refracts and emits from said upper component lens said circular whole incipient beam, forming a convergent-divergent conical concentrated beam;
a lower component lens LRLT mounted below said upper component lens and having a concave conical section which receives and transmits into said lower component lens said convergent-divergent conical concentrated beam, having a concave conical reflective section which reflects said convergent-divergent conical concentrated beam, forming a convergent conical beam, having a concave conical section which refracts and emits from said lower component lens said convergent conical beam, forming a convergent lateral beam in a horizontal plane, and having a convex conical reflective section which reflects said convergent lateral beam, forming a circular whole concentrated beam which is emitted parallel to the vertical optic axis of the lenses; and
a cylindrical casing serving as mounting means and aligning means of said upper component lens and of said lower component lens.

4,603,950

PROJECTION LENS

Makoto Uehara, Tokyo, and Satoshi Mogami, Machida, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 570,769
Claims priority, application Japan, Jan. 21, 1983, 58-7394
Int. Cl.[4] G02B *13/18, 9/34*
U.S. Cl. 350—432 12 Claims



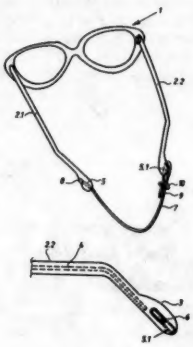
1. A projection lens for enlargedly projecting an image onto a screen, comprising, in succession from the screen side:
a first lens having a positive refractive power;
a second lens having a positive refractive power and having meniscus shape convex to the screen, said second lens being disposed substantially at the entrance pupil position of the entire system and having the function of chiefly correcting the balance of coma,
a biconvex third lens having a positive refractive power; and
a fourth lens having a negative refractive power and having its surface of sharper curvature facing to the screen.

4,603,951

SPECTACLE FRAME WITH SECURING BAND

Rainer Beck, Oelde, and Alfons Schülte, Beckum, both of Fed. Rep. of Germany, assignors to Eugen Beck, KG, Oelde, Fed. Rep. of Germany

Continuation of Ser. No. 419,588, Sep. 17, 1982, abandoned. This application May 20, 1985, Ser. No. 736,515
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 8127522[U]; Feb. 6, 1982, 8203188[U]
Int. Cl.[4] G02C *2/00*
U.S. Cl. 351—156 7 Claims



1. Spectacle frame having a removable elastic safety band attached to temples of the frame designated a first temple and a second temple, fastening means for the safety band in the form of an elastic string at the end region near the ear of each of the two temples, a single elongated hole with an inlet opening and an exit opening in each temple in which hole the exit opening is, at least in the second temple, of drop-shaped configuration, said exit opening having a longitudinal axis extending approximately parallel to the temple and a pointing end directed towards the ear end of the temple, said safety band having a free end guided through the hole forming essentially an U-shaped loop running toward the ear end of the temple with the vertex of the U located in the tip of the exit opening, whereby pulling of the free end of the loop toward the ear end of the temple clamps the vertex of the U in said pointing end of the exit opening, and pulling of the free end of the loop in a direction away from the ear end unclamps the vertex of the U permitting adjustment of the length of the safety band.

4,603,952

PROFESSIONAL STEREOSCOPIC PROJECTION

John R. Sybenga, 2009 S. M Extension, Oskaloosa, Iowa 52577

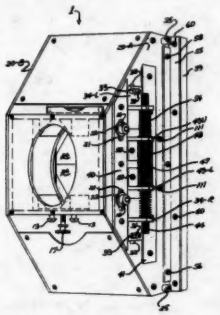
Filed Apr. 18, 1983, Ser. No. 486,035
Int. Cl.[4] G03B *35/02*
U.S. Cl. 352—65 9 Claims

1. An improved apparatus for the presentation of stereoscopic images utilizing program material in which the right and left eye stereo pair images are contained upon a single strip of transparency film, such as motion picture film, said images situated in a one-above-the-other configuration, to be projected upon a viewing screen surface by conventional and unaltered projection equipment utilizing an ordinary projec-

tion lens system to be used in conjunction with my invention comprising a combination of:

(a) an attaching means with two upright side walls, a horizontal top wall, and a horizontal bottom wall formed as one unit with two protruding members rigidly attached to the central innermost portion of said top wall and facing downwardly, said protruding member being suitably fashioned to form a means capable of receiving a cylindrically shaped object, such as a projection lens barrel, a movable plate member adjacent to said bottom wall, an adjusting means utilizing a rotatable threaded rod member introduced upwardly through said bottommost wall and in contact with the underside of said movable plate so as to apply force to and cause movement of said movable plate toward or away from the said upper receiving surface thereby providing a means for receiving and grasping a said cylindrically shaped object,

(b) a housing assembly comprising two upright side walls, a top wall, a bottom wall, and a front wall containing suitable openings, the rear of said housing assembly being slidably fitted onto said upright side walls of said attaching means in a manner allowing a vertical sliding motion of said housing assembly relative to stationary said attaching means, said slidable motion thereby provides a means to adjust and align said housing assembly so as to be concentric with the longitudinal axis of said cylindrically shaped object being so grasped by said receiving and grasping means,



(c) a securing means to arrest said sliding motion at any position,

(d) a "V" shaped member extending horizontally and affixed between said upright side walls of said housing assembly and bearing two optical reflecting mirrors so aligned with the closed end of said "V" configuration pointing rearwardly and with the reflecting surfaces of said mirrors facing outwardly with said reflecting surfaces fixed at an angle of 92 degrees,

(e) a shaft member suspended rotatably within and between the uppermost portion of said upright side walls of said housing and attached to and bearing the frontmost edge of another reflecting mirror member, the reflecting surface of said mirror member facing frontwardly,

(f) a second identical shaft member also suspended rotatably within and between the lowermost portion of said upright side walls of said housing assembly, also attached to and bearing the frontmost edge of an identical second reflecting mirror member orientated invertedly to the first said rotatably suspended mirror, but with reflecting surface also facing frontwardly,

(g) a second set of shaft members affixed to the rearmost edge of each said rotatably suspended mirror members, one end of each said second shaft member extending through suitable openings in one said upright side wall of said housing assembly,

(h) a mirror reflecting angle adjusting means attached to the outside central portion of one said upright side wall of said housing assembly and comprising of a cylindrically shaped micrometer roller member mounted rotatably but captively between a top and a bottom "L" shaped mounting bracket members which are affixed to said upright side wall, a rotatable threaded rod member mounted lengthwise and midway within said roller member by means of a suitably threaded hole, said threaded hole also containing a means to arrest the turn-on-thread rotary motion of said threaded rod member, said threaded rod member having left hand threading on one end and right hand threading on the other end to suit a top and a bottom "T" shaped members movably but captively mounted on said upright side wall, one of which has left hand threaded receptacle and the other having right hand threaded receptacle, said "T" shaped members each containing angular slot into which said protruding ends of each said rearwardmost mirror bearing shaft engages thereby providing a means for precisely adjusting the reflective angles of said mirrors in an opposidly fashion and in exact unison by the same degree simultaneously, and also providing a means for attaining an independent adjustment of said reflecting angles, also achieved in unison, but relative to and between the rotational angularity of said rotatably suspended mirror members, said independent adjustment accomplished by manipulation of said means to arrest said turn-on-threads rotary motion of said threaded rod member situated within said cylindrically shaped micrometer roller member to a different rotational position for arrestment thereby providing a means to alter the placement in a vertical fashion of respective said left and right eye stereo pair images upon said viewing screen,

(i) an additional mirror orientating adjustment means not related to, and with a distinct purpose from the first said adjustment means, said additional mirror orientation means comprising of an eccentric extension member rotatably affixed to, and provided with a means to arrest said rotation at any position, one end of each said rotatably suspended mirror bearing shaft members, said eccentric members being used to complete the suspension of one end of each said rotatably suspended mirror bearing shaft member within and between said upright side walls of said housing assembly, thereby providing a means for imparting a horizontal tilting adjustment to said rotatably suspended mirror bearing shafts, the degree of said horizontal tilting adjustment being dependent upon the rotational position of said eccentric member, said horizontal tilting adjustment provides a means to independently control the placement in a horizontal fashion of said respective left and right eye stereo pair images upon said viewing screen surface,

(j) a rectangular shaped front wall plate containing a top and a bottom openings, and flange members affixed to the outtermost front surface edges of said front wall plate, said flange members being capable of receiving and retaining other members constituting polarizing or other appropriate light filtering mediums, a centrally located screw member to retain and register said filter mediums in place upon said front wall, said front wall being mounted adjacent to and in front of said housing assembly in a vertical position with said openings being located at the top and bottom portions and aligned with the reflective areas of said rotatably suspended mirrors contained within said housing assembly,

(k) a leveling indicator device adjustably attached in a convenient location upon the body of the invention,

(l) a suitable chemical bonding substance, such as commercially available silicone glue, used to affix said reflecting mirror and other suitable members to their said respective bearing members, thereby providing a means to avoid a prolifera of labor intensive mechanical mounting components, said chemical substance also serving a dual function of absorbing kinetic energy thereby providing a means for protecting fragile or vibration sensitive members.

4,603,953
FLASH DEVICE

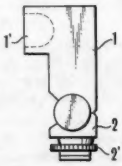
Isao Watanabe, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1984, Ser. No. 590,065

Claims priority, application Japan, Mar. 28, 1983, 58-44688[U]

Int. Cl.⁴ G03B *15/05*

U.S. Cl. 354—126 **2 Claims**



1. A flash device which can be mounted on an accessory shoe part of a camera body, comprising:

(a) a mounting part for mounting said flash device on said accessory shoe part of the camera body;

(b) a stationary part formed integrally with said mounting part, wherein a display part is arranged at a first position close to said mounting part of the stationary part and an operation member of the flash device is arranged at a second position which is spaced away from the mounting part a greater distance than the first position; and

(c) a body part turnably connected to said stationary part, wherein a light emitting part is provided at said body part, said body part being turnable from a usable position to an unusable position relative to the stationary part and having an end portion of the body part located at a position which is higher than the first position and which is positionable to cover the second position when the body part is at a usable position relative to the stationary part, said end portion of the body part being shifted to a position higher than the second position when the body part is at the unusable position.

4,603,954
SYNCHRONIZING DEVICE FOR FLASH PHOTOGRAPHY

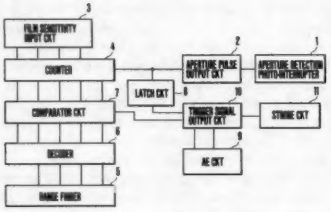
Akira Egawa, and Takanori Kodaira, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,400

Claims priority, application Japan, Dec. 22, 1983, 58-242679; Dec. 29, 1983, 58-250263; Dec. 29, 1983, 58-250266

Int. Cl.⁴ G03B *15/05*

U.S. Cl. 354—137 **8 Claims**



1. A flash control device for flash photography, comprising:

(a) distance information transfer means for transferring information of distance to an object;

(b) film sensitivity information transfer means for transfering film sensitivity information;

(c) aperture information transfer means for transferring aperture opening information;

(d) flash control means for producing a flash signal for flash photography in response to a predetermined state of an output of said aperture information transfer means relative to an output of said distance information transfer means and an output of said film sensitivity information transfer means; and

(e) prevention means for preventing said flash signal from being produced by said flash control means until the aperture opening information reaches a predetermined value.

4,603,955
DATA TRANSMISSION BETWEEN INTERCHANGEABLE LENS AND A CAMERA BODY

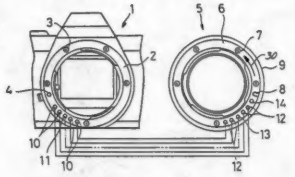
Yasuyuki Haneishi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1985, Ser. No. 692,730

Claims priority, application Japan, Jan. 20, 1984, 59-5307[U]; Jan. 23, 1984, 59-6316[U]

Int. Cl.⁴ G03B *17/00*

U.S. Cl. 354—286 **18 Claims**



1. In a camera having a camera body and an interchangeable lens engageable with the camera body, the improvement comprising:

a lens mount having a first flat surface;

an electrically conductive camera mount having a second flat surface;

means for engageably securing the lens mount to the camera mount by rotation of the lens mount relative to the camera mount with the flat surfaces of the lens mount and camera mount in abutting relationship;

a first electrical contact in the lens mount movable normal to the first surface;

spring means for urging the first contact out of the first surface;

a stationary second electrical contact in the camera mount, the second contact opening toward the second surface without protruding therefrom in alignment with the first contact when the lens mount is secured to the camera mount so the first contact normally bears against the second contact;

means for insulating the second contact from the camera body;

means for alternately connecting and disconnecting the second contact electrically to and from the camera mount through the first contact;

a plurality of third contacts in the camera mount movable normal to the second surface;

one or more stationary insulative regions in the lens mount opening toward the first surface without protruding therefrom in alignment with one or more of the respective third contacts so the one or more of the respective third contacts bear against the respective one or more insulative regions when the lens mount engages the camera mount;

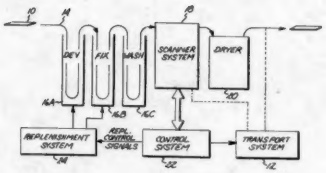
means responsive to rotation of the lens mount as the lens mount is secured to the camera mount for wiping foreign matter from the second contact; and

means for disabling the wiping means when the second contact is connected to the camera mount.

4,603,956
FILM-WIDTH AND TRANSMITTANCE SCANNER SYSTEM

Richard W. Baker, Anoka, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Nov. 16, 1984, Ser. No. 671,954
Int. Cl.[4] G03D *13/00*; G01N *21/84*; G01B *11/04*
U.S. Cl. 354—298 **21 Claims**

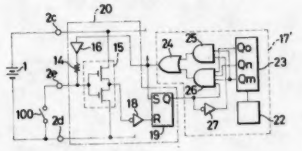


1. A replenishment control for a processor of continuous tone film in which the film is transported along a film transport path, the replenishment control comprising:
- means for scanning a light spot across at least a portion of the film transport path;
- means for providing a sensor signal which is a function of intensity of the light spot after the light spot has passed through the film transport path;
- means for periodically sampling the sensor signal during each scan to produce a plurality of sample values for each scan;
- means for converting each sample value to a density value;
- means for summing the density values to produce an integrated density value; and
- means for producing a replenishment control signal as a function of the integrated density value.

4,603,957
SWITCH STATE DETECTING APPARATUS FOR A CAMERA

Nobuyuki Suzuki, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,094
Claims priority, application Japan, Feb. 13, 1984, 59-24680
Int. Cl.[4] G03B *7/00, 17/00*
U.S. Cl. 354—410 **16 Claims**

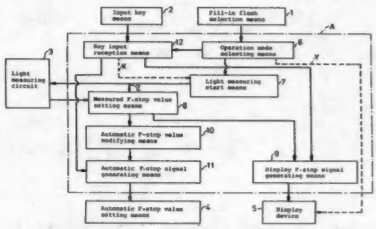


1. A photographing apparatus comprising:
- (a) an operation member for selecting use or non-use of the photographing apparatus;
- (b) switch means which changes its switch state in accordance with an operation of the photographing apparatus other than the operation of the photographing apparatus whose use or non-use of the photographing apparatus is selected by the operation member;
- (c) a detecting circuit for delivering an electrical signal for detecting the state of the switch so as to detect the state of the switch means; and
- (d) a control circuit for making the delivery per unit time of the electrical signal from the detecting circuit when the use of the photographing apparatus is selected different from that when the non-use is selected.

4,603,958
AUTOMATIC ELECTRONIC FLASH

Yuji Maruyama, and Katsumi Horinishi, both of Suita, Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Nov. 13, 1984, Ser. No. 671,126
Claims priority, application Japan, Nov. 15, 1983, 58-215613; Mar. 13, 1984, 59-47637
Int. Cl.[4] G03B *15/02*
U.S. Cl. 354—414 **8 Claims**


Input key means
Fill-in flash selection means
Key input reception means
Operation mode selecting means
Light measuring circuit
Light measuring start means
Measured F-stop value setting means
Automatic F-stop value modifying means
Automatic F-stop signal generating means
Display F-stop signal generating means
Automatic F-stop value setting means
Display device

1. An automatic electronic flash comprising:
- key input means for inputting photographing data such as F-stop value,
- key input reception means for outputting electric signals responding to input operation by said key input means,
- fill-in flash selection means for selecting fill-in flash photographing when a photographic scene has a rear lighting,
- display means for displaying a display F-stop value to be set on a camera to be used with automatic electronic flash,
- an automatic F-stop value setting circuit for setting an automatic F-stop value responding to an F-stop selection signal,
- a light measuring circuit for measuring brightness of scene and issuing a brightness signal responding to said measurement.
- operation mode selecting means for selecting an ordinary mode for photographing ordinarly lighted scene and a fill-in flash mode for photographing a rear-lighted scene responsive to the output of said fill-in flash selection means,
- light measuring start means for setting starting time of light measuring in said fill-in flash mode,
- measured F-stop value setting means for setting measured F-stop value, being based on said brightness signal, film sensitivity and shutter speed of said camera, to produce a measured F-stop value signal,
- display signal generating means for generating display F-stop value signal being based on said measured stop signal, in case of a rear light photographing and on said outputted electric signal of said key input reception means in case of an ordinarily lighted scee, to actuate said display means,
- automatic F-stop value modifying means for generating a first automatic F-stop value signal which modifies said measured F-stop value signal to a value lower by 1–2 EV than said display stop value signal, and
- automatic F-stop signal generating means for generating a second automatic F-stop value signal which corresponds to said first automatic F-stop value signal in said automatic F-stop value modifying means and to said outputted electric signal of said key input reception means in case of a usual photographing and sets said automatic F-stop value setting circuit.

4,603,959
PHOTOGRAPHIC INFORMATION GENERATING APPARATUS FOR CAMERA

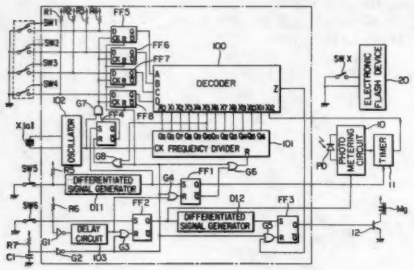
Hisatoshi Takahata, Sakura, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,854

Claims priority, application Japan, Sep. 20, 1983, 58-145654[U]

Int. Cl.⁴ G03B *15/05*

U.S. Cl. 354—420 **7 Claims**



1. A camera which initiates exposure by driving of a shutter, comprising:

(a) timer means for counting plural times respectively in response to driving of the shutter, the timer means generating an output signal each time the respective times are counted;

(b) setting means for setting exposure information for controlling a shutter speed and for generating an output signal corresponding to the exposure information;

(c) control means for controlling shutter speed in accordance with output signal from said timer means and output signal from said setting means;

(d) latch means for latching the output signal from said setting means in response to the driving of said shutter, said control means controlling said shutter in accordance with latched output signal; and

(e) releasing means for releasing a latching operation of the output signal from said setting means by said latch means, in response to output signal from said timer means at a time when said timer means counts a predetermined time of said plural times.

4,603,960
METHOD FOR AND APPARATUS FOR DETERMINING AN OPTIMUM GRADATION PARAMETER FOR DEVELOPING AERIAL PHOTOGRAPHS

Ulrich Zeth; Heinrich Klose; Günther Voss, and Peter Winkler, all of Jena, German Democratic Rep., assignors to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Continuation-in-part of Ser. No. 340,489, Feb. 16, 1982, abandoned. This application Oct. 30, 1984, Ser. No. 666,398

Claims priority, application German Democratic Rep., Apr. 2, 1981, 229118

Int. Cl.⁴ G03B *7/08, 39/00*

U.S. Cl. 354—432 **6 Claims**

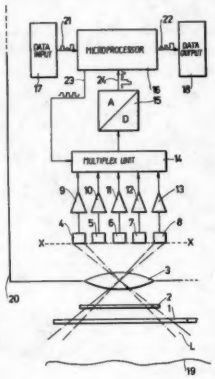
1. A method for determining an optimum gradation parameter for use in developing aerial photographs comprising the steps of

adapting the spectral sensitivity of an array of photodetectors to that of a film material used,

detecting brightness information of terrain objects at a plurality of points and converting said brightness informations into corresponding signals by said array of photodetectors,

cyclically sampling said photodetectors at a preselected clock-pulse frequency to obtain measuring signals,

selecting from a sequence of sampled measuring signals a maximum signal value E max indicative of a maximum brightness and a minimum signal value E min indicative of a minimum brightness of a sampling cycle,



subjecting both the sequence of maximum signal values and the sequence of minimum signal values to a smoothing operation, and determining a gradation value γ from said smoothed maximum and minimum signal values according to the relationship

$$\gamma = \frac{\Delta s}{lg\left(\frac{E_{max}}{E_{min}}\right)}$$

for later use in a development of a film material exposed simultaneously with determining the respectively associated gradation value γ, wherein Δs is the optimal density value of the film material.

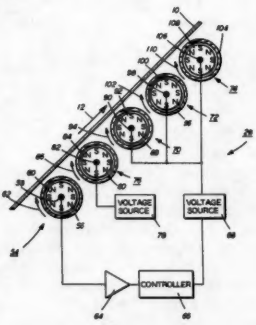
4,603,961
DEVELOPMENT SYSTEM

Jeffrey J. Folkins, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 13, 1985, Ser. No. 744,184

Int. Cl.⁴ G03G *15/09*

U.S. Cl. 355—3 DD **10 Claims**



1. An electrophotographic printing machine of the type

having a photoconductive member with at least one electrostatic latent image recorded thereon, wherein the improvement includes:

means for supporting a developer material closely adjacent to the photoconductive member;

means, coupled to said supporting means, for generating a control signal as a function of the electrical potential on the photoconductive member;

first means for developing the electrostatic latent image;

first means for electrically biasing said first developing means to a substantially fixed electrical bias;

second means for developing the electrostatic latent image, said first developing means being interposed between said second developing means and said supporting means; and

second means, responsive to the control signal from said generating means, for electrically biasing said second developing means.

4,603,962

IMAGE FORMING APPARATUS WITH A DISPLAY DEVICE FOR MATCHING THE IMAGE SIZE WITH THE COPYING SHEET SIZE

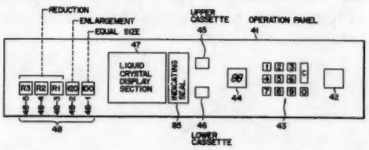
Hitoshi Dekura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

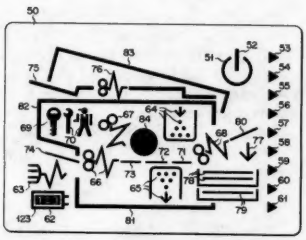
Filed Apr. 23, 1984, Ser. No. 602,690

Claims priority, application Japan, Apr. 26, 1983, 58-73383

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 R **2 Claims**





1. An image forming apparatus comprising:

means for selecting one cassette which is detachably loaded in said image forming apparatus, each of said cassettes holding a plurality of copying sheets having a specified size and a specified feeding direction of said sheets;

means for detecting said specified size and said specified feeding direction of said sheets contained in said selected cassette;

means for selecting an operation mode in response to which a required image forming magnification factor is selected; and

display means for displaying operation conditions of said image forming apparatus, said display means including:

a display panel section including a plurality of first light-emitting indicating units for indicating the type of cassette selected, and a plurality of second light-emitting indicating units for indicating when said selected operation mode is mismatched with said selected cassette; and

an indicating section including a plurality of symbols arranged to correspond to said first light-emitting indicating units, each of said symbols indicating the size of the copying sheets contained in said selected cassette, and a plurality of instructions in the form of characters arrranged to correspond to said second light-emitting indicating units, said instructions instructing an operator to replace said selected cassette when one of said second light-emitting indicating units is activated.

4,603,963

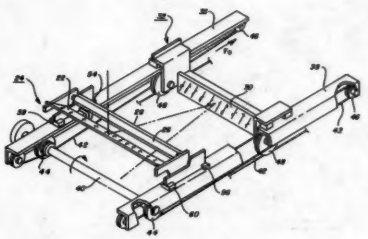
OPTICAL SCANNING CARRIAGE

John H. Hinton, Ontario; William T. Foti, Caledonia, and Philip J. Giguere, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1984, Ser. No. 660,766

Int. Cl.[4] G03G *15/04*

U.S. Cl. 355—8 **1 Claim**



1. An optical scanning system in which an original document on a transparent document support is incrementally scanned by a plurality of movable optical components located beneath said support and a flowing light image of said document is projected upon a photosensitive member, said system including:

a pair of ferrous-containing guide members mounted parallel to each other and in a plane parallel to and beneath said document support, the top surface of said guide members being coated with a polyethylene material,

a scanning carriage adapted for sliding contact along said guide members by means of at least a first and second magnet, each magnet in contact with a respective guide member, whereby, during carriage motion, said magnets create an attractive magnetic field between said carriage and said guide member so as to maintain a uniform sliding contact between carriage and guide member.

4,603,964

PHOTORECEPTOR CHARGING SCOROTRON

Gregory B. Swistak, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1984, Ser. No. 663,633

Int. Cl.[4] G03G *15/02*

U.S. Cl. 355—14 CH **3 Claims**

1. In a xerographic type copying or printing apparatus having a movable photoreceptor; exposure means for exposing the photoreceptor to create a latent electrostatic copy image on the photoreceptor; developing means for developing the copy image; and transfer means for transferring the developed image to a copy substrate material; the combination of:

(a) an elongated generally U-shaped shield having a conductive back plate with non-conductive side members, said shield being supported in spaced relation with said photoreceptor with the open side of said U-shaped shield facing said photoreceptor, the longitudinal axis of said shield being substantially perpendicular to the direction of photoreceptor movement;

(b) at least one corona emitting wire in said shield adapted when actuated to emit ions for charging the photoreceptor, the axis of said corona wire being substantially per-

pendicular to the direction of movement of said photoreceptor with the axial length of said corona wire being substantially equal to the operating width of said photoreceptor;

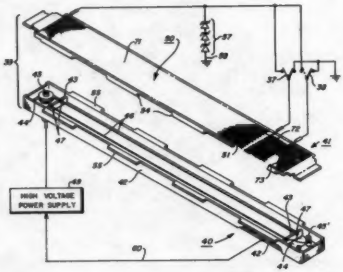
(c) means to apply a potential between said corona wire and said back plate whereby said corona wire emits said ions;

(d) grid means interposed between said corona wire and said photoreceptor for controlling the passage of ions from said corona wire to said photoreceptor;

(e) means for electrically separating said grid means into a succession of grid segments, each of said grid segments having a predetermined axial length for controlling charging of a corresponding area of said photoreceptor by said corona wire;

(f) a source of potential for biasing said grid segments to control the flow of ions from said corona wire to said photoreceptor;

(g) means coupling a predetermined first one of said grid



segments to said potential source whereby on actuation of said machine an area of said photoreceptor corresponding to the length of said first grid segment is charged, and

(h) control means for coupling selected ones of the remaining grid segments to said potential source in response to second image sizes being produced whereby to correlate the area of said photoreceptor charged by said charging means with the second image size being produced;

said control means including switch means associated with each of the remaining ones of said grid segments, said switch means serving when actuated to a first switch condition to couple the grid segment associated therewith to said potential source whereby actuation of one or more of said switch means to said first switch condition couples succeeding ones of said grid segments to said potential source whereby to increase the area of said photoreceptor charged by said charging means;

(i) said second image sizes being larger than said first image size.

4,603,965

APPARATUS AND METHOD FOR MAKING COLOR PHOTOGRAPHIC PRINTS

Kenneth O. Cook, 426 Palma Dr., Salinas, Calif. 93901

Filed Jun. 28, 1985, Ser. No. 750,379

Int. Cl.[4] G03B *27/80, 27/62*

U.S. Cl. 355—38 **28 Claims**

1. A color printing apparatus comprising:

a light chamber having a number of light sensors therein, each sensor being responsive to light of a particular color;

a light source;

means for directing a light beam along a path from the light source toward the light chamber;

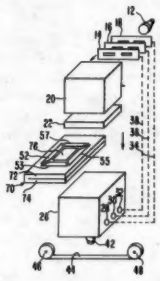
a negative carrier across the light beam for holding a negative to be printed;

a lens coupled with the light chamber for directing light out of the same;

a color paper strip aligned with the lens for receiving light therefrom for exposure of the color paper strip to form the image of a negative held by the carrier;

a number of actuatable color filters between the light source and the color paper strip, said filters being coupled to respective sensors for actuation thereby; and

means coupled with the light chamber for providing addi-



tional, at least partially filtered light thereto for mixture with the light passing through the negative, whereby the sensors will respond to the total light in the light chamber in a manner to cause respective filters to be actuated such that the resulting color print will more nearly approach the color density and balance achieved with a color print made from a master negative.

4,603,966

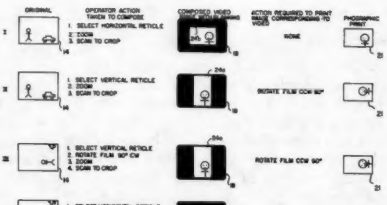
FILM VIDEO PLAYER/PRINTER WITH CROPPING CONTROL

Scott A. Brownstein, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 28, 1985, Ser. No. 770,121

Int. Cl.[4] G03B *13/28;* **H04N** *7/18*

U.S. Cl. 355—45 **9 Claims**



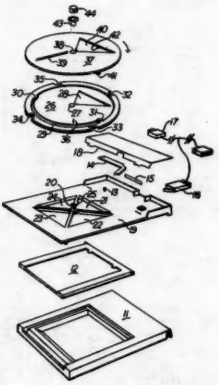
1. In a film video player having photographic printer means for making an optical print corresponding to a film image displayed on a video monitor, the improvement comprising:

electronic display means for displaying a rectangular reticle on said monitor within the border of the image displayed, the perimeter of the reticle encompassing the portion of the film image displayed that is to be printed.

4,603,967
ROTARY-DISC TEST PRINTING EASEL

John T. Virtanen, 9 Haldon Ave. Apt. 334, Toronto, Ontario, Canada M4C 4P5

Filed Mar. 11, 1983, Ser. No. 474,276
Int. Cl.[4] G03B *27/58*
U.S. Cl. 355—72 6 Claims

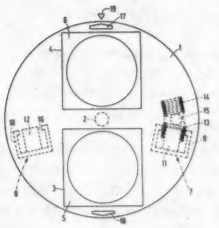


1. A lighttight apparatus adapted to enclose and allow an economic size cutting of light-sensitive photographic color printing paper to be test exposed for color evaluation in an optional number of two or more step-divided segments of the paper, by projecting a beam of light through a color negative positioned in a standard color printing enlarger, onto the said sheet of photographic paper, positioned on the easel of said apparatus, through triangular shaped window apertures formed in mated pairs of rotatable disc sets adapted to be set in registered position by multiply utilized step shaped registration slots formed on the circumferential edge of the one disc of a pair of said disc sets, with the said light-sensitive paper enclosed therein automatically covered over as the aperture openings of said mated pairs of discs are rotatively advanced to the said registered stop positions between steps of exposing individual segments of the said paper; said apparatus comprising a lighttight, light-sensitive paper storage means, forming a paper-safe base member, fitted with a hingeable lighttight cover easel having a recessed top surface plane on which to place and expose a sheet of photographic paper in registered position, with the light-sensitive paper stored inside said paper-safe base member protected from exposrue to light; said base member further comprising a paper holding platen to be hingeably and removably attached; said platen having a reinforcing rib formed on the bottom surface plane, enclosing divided segments of a centrally positioned window opening; said reinforcing rib interrelating with the curb, provided by the recessed surface plane of said easel, to form a lighttight seal; said paper holding platen further including a mechanical enclosure positioned on the top rear surface plane, having fittings formed therein on which to assemble and allow the free movement and interaction of a spring triggered pivotal pawl, steel spring and an optional plug-in lever operated electrical current switch adapter, fitted to an electrical cord , to which an electric light bulb is attached, connected to an electric power source adapted to be switched off and on automatically, by means of the pawl interacting with the circumferential edge and step formed aperture setting slots of said disc sets as the top disc of said pairs of disc sets is rotated, at and between said aperture setting slots, causing said pawl to interact with the lever of said current switch to allow said light bulb to be integrated with the aperture stepped, test exposing function of the said disc sets of the invention; said platen further comprising a snap-on cap, to allow said disc sets to be attached, interchanged and freely rotated about a vertical axle post formed on bridge members dividing segments of said window opening forming a lighttight, rotatably stepped aperture disc, paper exposing cover means.

4,603,968
DEVICE FOR EXCHANGING MASKS

Robert H. Munnig Schmidt, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1985, Ser. No. 731,634
Claims priority, application Netherlands, May 9, 1984, 8401476
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—75 3 Claims

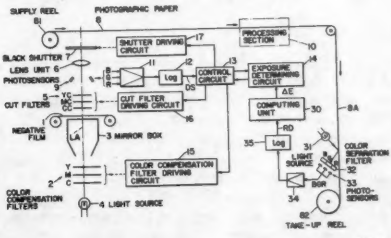


1. A device for exchanging masks used in the photolithographic treatment of semiconductor devices, in which device supporting places for a number of masks are present on a rotatable disk, the disk bringing one of the mask supporting places in a position desired for photolithographic treatment, which position can be determined by means of a detector, which, after a position-servo-system has been switched into circuit, supplies a detector signal to this system and thus controls the adjustment of the disk, characterized in that for rotation of the disk two electromagnetic movement systems are present each comprising a magnet and a coil, wherein either the pair of magnets or the pair of coils is fixedly arranged and the other pair is provided on the turntable and is rotatable therewith, a current connection is present for the coils and means is provided for supplying a constant current to the coils.

4,603,969
METHOD FOR SETTING CONDITIONS IN PHOTOGRAPHIC PRINTING

Takaaki Terashita, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 4, 1985, Ser. No. 697,841
Claims priority, application Japan, Feb. 6, 1984, 59-19587; Apr. 4, 1984, 59-67170
Int. Cl.[4] G03B *27/32, 27/80*
U.S. Cl. 355—77 4 Claims



1. A method for setting conditions in a photographic printing system in which an exposure amount for a photographic

paper is controlled by inserting and removing color compensation filters in a photographic printing light path, which comprises the steps of:

measuring a light amount with a photosensor by inserting and removing the color compensation filters from the light path;

calculating a correction amount D_1 for light source variations in comparison with a reference value on the basis of the light amount measurement;

calculating a control amount D_2 needed to effect a desired density for a photographic paper on the basis of a difference value determined from a previously stored standard negative film density $\overline{U}$ and the calculated correction amount D_1;

storing the correction amount D_1 and the control amount D_2;

respectively changing the standard negative film density $\overline{U}$, the correction amounts D_1 and the control amount D_2 in accordance with respective detected variations thereof; and

controlling the inserting and removing of the color compensation filters so that an amount of light corresponding to an exposure reference value which impinges on the photographic paper is equal to an exposure reference value which is obtained by combining the difference value and the control amount D_2.

4,603,970

APPARATUS FOR INHIBITING COPYING OF CONFIDENTIAL DOCUMENTS

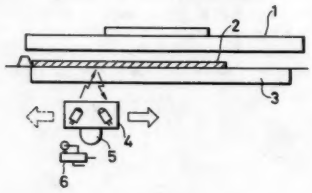
Koichi Aota; Katsuhiko Ishikawa, and Naoki Yokoi, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,510

Claims priority, application Japan, Jul. 9, 1982, 57-118672; Jul. 29, 1982, 57-131268

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—133 **8 Claims**



1. An apparatus for inhibiting the copying of information on a manuscript sheet treated with an infrared ray-absorbing agent, said apparatus comprising:

scanning means for scanning said sheet for infrared ray-absorbing regions;

comparison means for comparing an output of said scanning means to a reference level; and

means responsive to an output of said comparison means for determining the size of detected infrared ray-absorbing regions and for preventing the copying of the information upon the detection of the presence of an infrared ray-absorbing region greater than a predetermined size.

4,603,971

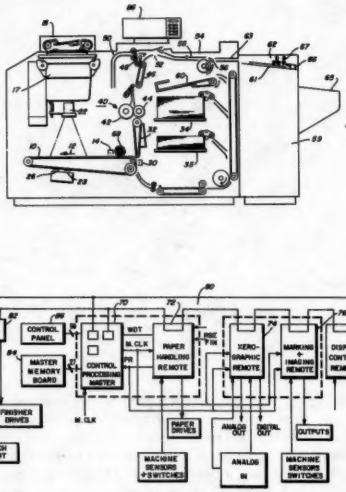
FINISHER MODE SWITCHING

William P. Kukucka; Robert L. Sklut, both of Webster, and John F. Gauronski, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1984, Ser. No. 651,500

Int. Cl.[4] G03G *15/00, 21/00*

U.S. Cl. 355—133 **8 Claims**



1. In a reproduction machine having a photosensitive member and a plurality of operating components including a finisher and a control panel cooperating with one another and the photosensitive member in time periods determined by pitches to produce impressions on copy sheets, the finisher including a staple mode to staple a set of copy sheets together and a bind mode to bind a set of copy sheets together, the method of changing from the staple mode to the bind mode or from the bind mode to the staple mode comprising the steps of:

initiating a mode change at the control panel while the machine is operating in either the bind mode or the staple mode,

determining if the present mode or the previous mode was a bind mode,

delaying the feeding of copy sheets in the finisher for a first given time period,

delaying the mode change initiation by a second time period different from said first given time period, and

resuming operation of the finisher in the new mode.

4,603,972

DISTANCE MEASUREMENT

Graham L. Adams, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,410

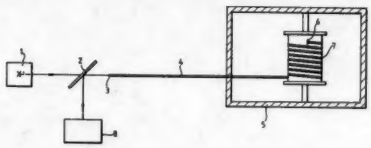
Claims priority, application United Kingdom, Jul. 7, 1983, 8318471

Int. Cl.[4] G01C *3/08*

U.S. Cl. 356—4 **3 Claims**

2. An instrument for determining the change in distance between a datum point and a body in relative movement away from that datum point, wherein an optical fibre, having an end secured to the datum point, extends to the body which carries the remainder of the fibre coiled for paying-off as the distance increases, wherein means are provided at one end of the fibre to measure changes in optical attenuation of the fibre, and

wherein distance changes are determined from the measure of the decrease in fibre attenuation resulting from a reduction of



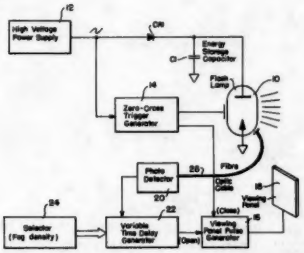
its bending losses as progressively more of the coil is paid-off with increasing separation.

4,603,973

VISIBILITY ENHANCEMENT SYSTEM

Robert P. Crow, 15464 Hamner Dr., Los Angeles, Calif. 90077

Filed Jan. 26, 1984, Ser. No. 574,063
Int. Cl.[4] G01C *3/08;* H04N *7/00*
U.S. Cl. 356—5 **17 Claims**



1. A system for direct viewing an object through a diffusive medium located between the system and the object, said system including: an electric flash lamp for projecting successive flashes of light through the medium to the object to be reflected by the object; viewing means adapted to be interposed between the eyes of the viewer and the object and through which the object is directly observed by the viewer; said viewing means including an electro-optic shutter to permit the object to be viewed through the viewing means only when the shutter is open; first electric generator means connected to the flash lamp for introducing trigger pulses to the flash lamp to cause the flash lamp to project successive flashes of light each having a time duration of twice the light propagation time to a predetermined maximum range of the system; and second electric generator means coupled to said first generator means to introduce gate pulses to said optical shutter to cause the shutter to close before the initiation of each flash of said successive flashes of light and to open a predetermined time after the cessation of each flash of said successive flashes of light corresponding to twice the light propagation time to a selected cut-off distance of the system.

4,603,974

RETICLE USED IN SEMICONDUCTOR DEVICE FABRICATION AND A METHOD FOR INSPECTING A RETICLE PATTERN THEREON

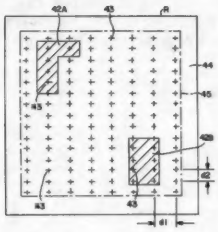
Shougo Matsui, Sagamihara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 27, 1985, Ser. No. 706,316
Claims priority, application Japan, Mar. 5, 1984, 59-41584
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—394 **10 Claims**

1. A reticle applied to a patterning process for fabricating a semiconductor device comprising:

a reticle substrate;

a reticle pattern formed in an actual pattern-region on a surface of said reticle substrate; and



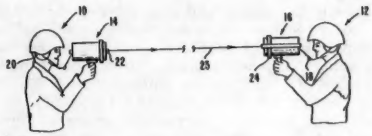
a reference pattern formed in said actual pattern-region on said surface with said reticle pattern, the reference pattern having a size less than a resolution limit of a reduction exposure performed in said patterning process.

4,603,975

APPARATUS AND METHOD FOR NIGHTTIME AND LOW VISIBILITY ALIGNMENT OF COMMUNICATORS

Robert J. Cinzori, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 130,637, Mar. 17, 1980. This application Apr. 29, 1982, Ser. No. 373,075
Int. Cl.[4] G01B *11/26;* G01C *1/00;* H04B *9/00*
U.S. Cl. 356—152 **9 Claims**



1. Apparatus for aligning a hand-held communication unit including a laser transmitter and a detector sensitive to incoming IR radiation containing encoded information, said communication means including focusing means for directing said incoming IR radiation to said detector, said apparatus comprising:

(a) means for determining the location of said radiation upon said detector, and for generating an electrical signal responsive thereto; said detector comprising a plurality of independent detector portions;

(b) electroluminescent means responsive to said electrical signal, said electroluminescent means comprising a plurality of electroluminescent devices arranged in a pattern coresponding to the geometry of said detector, so that there may be illuminated thereby a pattern indicative of the location of said transmission upon said detector;

(c) means for combining the electrical signal from each detector portion to provide an output signal for further processing to extract said encoded information;

(d) said apparatus further including a monocular having an eyepiece, said monocular being mounted with respect to said communication unit so that its movement directly affects the pointing direction of said unit; and

(e) said eyepiece having a reticle defining a plurality of eyepiece segments, each of said segments having both an electroluminescent device and a detector portion associated therewith.

4,603,976

OPTICAL MARK RECOGNITION APPARATUS

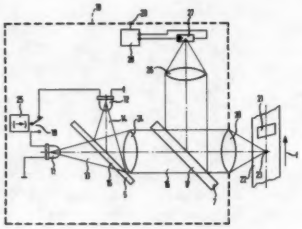
Günter Fetzer, Gundelfingen, and Jürgen Erdmann, Waldkirch, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,723

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242219

Int. Cl.[4] G01J *3/46;* G06K *7/12*

U.S. Cl. 356—402 10 Claims



1. In optical mark recognition apparatus comprising:

a light transmitter for transmitting a beam of light along a first optical path to a carrier bearing optical recognition marks,

a light receiver and photoreceiver, said light receiver directing light remitted from said carrier and said marks to said photoreceiver, and said photoreceiver providing an electrical signal representative of said remitted light, and

electronic processing means, connected to receive said electrical signal, for generqting a mark recognition signal,

the improvement characterized in that said light transmitter comprises:

a plurality of fixed light sources disposed in separate and distinct locations from one another, each said source providing light of a different characteristic spectral composition for accentuating the contrast between marks and carriers of different characteristic colours;

means in fixed disposition with respect to said light sources defining a plurality of optical paths having said first optical path in common for directing light from said light sources to said carrier, whereby said plurality of fixed light sources and optical paths define a plurality of independent modes of operation of said apparatus for enhancing the contrast of a plurality of mark-carrier colour combination, whereby said apparatus is continuously operable in each said mode for reading a succession of marks; and

switch means for selecting and energizing a light source from said plurality of fixed light sources to operate for successive mark readings, thereby selecting one of said modes of operation, said switch means energizing one and only one light source throughout the selected mode of operation.

4,603,977

MICROMOTILITY METER

James L. Bennett, Haslett, and Ralph A. Pax, Mason, both of Mich., assignors to Research Corporation, New York, N.Y.

Filed Oct. 31, 1984, Ser. No. 666,931

Int. Cl.[4] G01N *21/00*

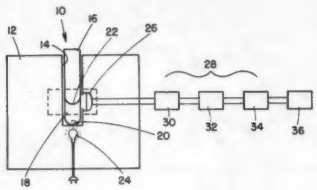
U.S. Cl. 356—436 33 Claims

1. A micromotility meter for evaluating the movement of helminths in solution, said meter comprising:

(a) a dark chamber for receiving a transparent container containing a test solution and a plurality of helminths in said solution, said solution defining a meniscus at a side wall of the container,

(b) a light source for directing light upwardly through said solution meniscus,

(c) photodetector means for collecting light refracted by said meniscus, said photodetector means generating a first signal that is modulated by variations in the refracted light caused by movement of the helminths,



(d) means responsive to said modulated first signal to provide an index of motility of the helminths.

4,603,978

LAMINATED BASE ELEMENT FOR A WRISTWATCH USING HOT MELT ADHESIVE FOIL

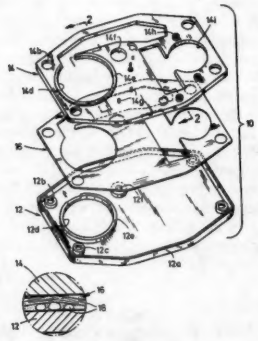
Fritz Brenk, Forlenweg, Fed. Rep. of Germany, assignor to Timex Corporation, Waterbury, Conn.

Filed Jun. 25, 1984, Ser. No. 624,171

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315634

Int. Cl.[4] G04B *37/00*

U.S. Cl. 368—317 5 Claims



1. A base element of simultaneously serving the purpose of a movement plate and a caseback for a wristwatch, said base element comprising of an outer plate, an inner plate, and an foil of thermoplastic plastics material arranged between them, said plates being bonded together in one piece by said thermoplastic material, said foil having spacer elements embedded in the thermoplastic material of said foil, whereby a minimum distance is defined between said plates by said spacer elements.

4,603,979

PROCEDURE AND MEANS FOR MEASURING THE INTERNAL FRICTION OF LIQUID SUBSTANCES

Aarre Matilainen, Lohkopeliontie 1 A 8, 00650 Helsinki, and Mauri Luukkala, Haukilahdenranta 23 B 5, 02170 Espoo, both of Finland

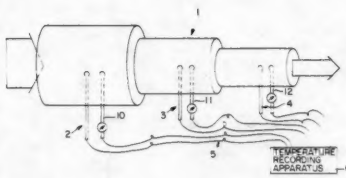
PCT No. PCT/FI84/00011, § 371 Date Sep. 26, 1984, § 102(e) Date Sep. 26, 1984, PCT Pub. No. WO84/03146, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 1, 1984, Ser. No. 662,425

Claims priority, application Finland, Feb. 7, 1983, 830410

Int. Cl.[4] G01N *25/00*

U.S. Cl. 374—54 5 Claims



1. A method of measuring flow friction of a liquid substance with high internal friction and viscosity, such as molten plastic mix, said liquid substance flowing in a special flow measuring sleeve having a flow area, and said liquid substance having a flow velocity, said method comprising the steps of;

stepwise increasing said flow velocity by stepwise reducing said flow area of said measuring sleeve,

mounting a thermometer in the flow of said liquid substance upstream of the reduced flow area and mounting a thermometer in the flow of said liquid substance within the reduced flow area or areas,

measuring temperature changes caused by an increase of flow friction within said reduced flow area or areas,

and using said temperature changes to determine the flow friction of said liquid substance.

4,603,980

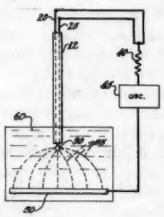
METHODS OF MEASURING TEMPERATURE AND ELECTRICAL RESISTIVITY IN A MOLTEN GLASS STREAM

James I. Berg, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 576,841, Feb. 3, 1984, abandoned. This application Aug. 2, 1985, Ser. No. 761,997

Int. Cl.[4] C03B *5/24;* G01K *7/02;* G01N *27/14*

U.S. Cl. 374—179 4 Claims



1. A method of measuring the temperature and electrical resistivity of a molten glass stream using a signal generating means, a signal detector means with the improvement comprising: measuring simultaneously at substantially the same location the temperature and the electrical resistivity of said glass stream by using a pair of electrodes with extreme disparity in sizes between said pair of electrodes with a sensor electrode of said pair of electrodes having a diameter of 2 mm to 10 mm, a return electrode of said pair of electrodes having a surface area of at least 100 times that of said sensor electrode, said sensor electrode comprising as the conductor wires of a thermocouple having only the junction exposed to contact with said molten glass stream and with a signal sent from said signal generating means through said pair of electrodes to said detector means.

4,603,981

DEVICE FOR REGULATING OR LIMITING AT LEAST ONE TEMPERATURE VALUE OR A TEMPERATURE RANGE OF RADIATION OR CONTACT HEATERS OF ELECTRIC COOKING APPARATUS

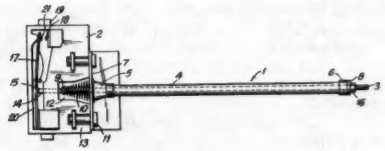
Karl Lieberth, Strasshof, Austria, assignor to Electrovac, Fabrikation elektronischer Spezialartikel Gesellschaft m.b.H., Vienna, Austria

Filed Oct. 19, 1984, Ser. No. 662,871

Claims priority, application Austria, Nov. 4, 1983, 3903/83

Int. Cl.[4] G01K *1/08*

U.S. Cl. 374—210 6 Claims



1. In a device for switching electric power in the operation of a heating element for regulating at least one temperature range in electric cooking apparatus, wherein at least one temperature sensor is provided for activating a switching element of the device for regulating the temperature, the sensor having a rod of high thermal expansion which is disposed in a tube of low thermal expansion, the tube being held between holding elements, the improvement comprising

a support member adjoining each end of the tube and surrounding the rod, the holding elements respectively adjoining said support members, said support members being positioned in seriatim along an axis of the tube between the adjoining holding element and an end surface of the tube, each said support member having a coefficient of thermal expansion α_1 which is smaller than a coefficient of thermal expansion α_2 of the adjoining holding element and larger than the coefficient of thermal expansion α_3 of the tube.

4,603,982

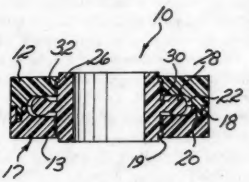
MOLDED BEARING

Patrick E. Dittrich, South Bend, Ind., assignor to Auscilla Plastics, Inc., South Bend, Ind.

Filed Feb. 21, 1985, Ser. No. 704,006

Int. Cl.[4] F16C *17/00, 33/20, 13/00*

U.S. Cl. 384—129 5 Claims



1. A bearing comprising an outer race which includes first

and second symmetrical race parts, an interior channel formed with said outer race, and an inner sleeve member positioned within said outer race and including a plurality of protrusions extending radially from said inner sleeve into said interior channel of the outer race, each protrusion being generally spherical in shape and including a web extending from each protrusion to said sleeve, each web being of lesser dimension than the diameter of each protusion wherein said protrusions are filled freely within said outer race interior channel, said protrusions constituting load bearing means for allowing free rotation of said sleeve member within said outer race.

4,603,983

AXIAL SHIFT ARRANGEMENT FOR TWO-ROW ANGULAR-CONTACT BEARING

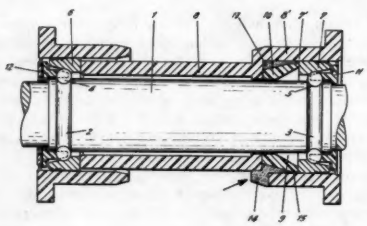
Heinrich Hofmann, Schweinfurt, and Günter Markfelder, Üchtelhausen, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KgaA), Fed. Rep. of Germany

Filed Nov. 14, 1985, Ser. No. 798,176

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447150

Int. Cl.⁴ F16C *19/18*

U.S. Cl. 384—512 **13 Claims**



1. A two-row angular contact bearing on a shaft, comprising:

a first and a second inner race being defined in and around the shaft at axially spaced locations along the shaft; a first and a second outer ring disposed around and having respective first and second races around the respective first and second inner rings; bearing rolling members rollingly supported between each inner race and the race of the respective outer ring;

a bushing around the shaft and extending between the first and the second outer rings and holding the outer rings apart; the bushing having a radially extending shoulder located between the outer rings and located nearer to the first outer ring, and the shoulder defining for the bushing a radially enlarged end section which extends from the shoulder and extends past and surrounds the first outer ring; the shoulder of the bushing being so placed axially with respect to the first outer ring that a free space is defined inside the enlarged end section of the bushing between the shoulder and the first outer ring;

an axial spring in the free space for urging the first outer ring away from the second outer ring; the spring being shaped in the free space for defining in the free space an open region which extends from the shoulder to the first outer ring;

a hardening material disposed in the open region for hardening and for thereby rigidifying and fixing the spacing between the bushing shoulder and the first outer ring.

4,603,984

APPARATUS AND METHOD FOR THE REDUCTION OF PRINTING OFFSET IN BIDIRECTIONAL PRINTING DEVICES

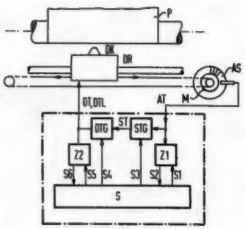
Hermann Ullenboom, Deisenhofen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 31, 1984, Ser. No. 666,735

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1983, 3339787

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—121 **4 Claims**



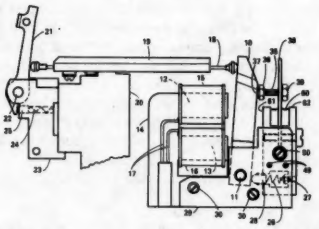
1. A method for the reduction of printing offset in successive print lines in a bidirectional dot-matrix printer having a sensing element for producing scan clock signals and means for deriving print clock signals from said scan clock signals, comprising the steps of providing at least one further print clock signal at the end of each print line beyond the last print clock signal which corresponds to printing information, initiating the braking of the printer carriage after the last of said further print clocks, and after reaccelerating said print carriage in the opposite direction counting said further print clock cycles before generation of print clocks which are coincident with printed information.

3. Apparatus for reducing printing offset in successive print lines in a dot-matrix printer having a bidirectional carriage and sensing means for generating the scan clock signals, and means for deriving print clock signals from said scan clock signals, a first counter connected to receive said scan clock signals and to count cycles thereof, and a second counter connected to receive said print clock signals and count cycles thereof, comprising in combination; a control unit connected to said first and second counters, a control clock generator connected to said first counter and to said control unit, and a print clock generator connected to said control clock generator and to said control unit, said control unit producing a first control signal connected to said first counter after the start of movement of the printer carriage, said first counter counting said scan clock signals for defining an acceleration phase of said printer carriage, said first counter providing a control signal to said control unit when a constant printing speed is reached, said control unit producing further control signals for controlling operation of said control clock generator, said print clock generator and said second counter, said second counter providing a control signal to said control unit at the end of each print line after the last printing position of a line has been reached, said control unit responding to said control signal from said second counter for disabling said control clock generator, said print clock generator, and said first counter after a predetermined interval.

4,603,985
BACKSTOP AND DAMPING APPARATUS FOR ACTUATOR

Edward F. Helinski, Johnson City, and Ho C. Lee, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1984, Ser. No. 622,827
Int. Cl.[4] B41J *9/42*
U.S. Cl. 400—167 **7 Claims**



1. An apparatus such as a print hammer having an actuator means including an actuator element moveable to effect operation such as printing,

said actuator element having a forward movement and a rebound movement,

a base member;

an improved stop mechanism for establishing an at-rest position and for damping the rebound energy of said actuator element comprising,

cantilever means comprising

a first cantilever beam secured at one end to said base member and having fixedly attached at its free end one end of a second cantilever beam in which said first and second cantilever beams have parallel bending axes relative to said base member and a backstop member supported by said second cantilever beam at a location between said bending axes whereby components of motion of the free ends of said first and second cantilever beams counteract each other to nullify components of motion normal to the direction of motion of said actuator element upon impact with said backstop member by said second cantilever beam, said second cantilever beam extending generally parallel with said first cantilever beam and towards said secured end and the backstop carried by the free end of the second cantilever beam lying in the path of motion of said actuator element to be impacted by said actuator element on rebound, and

a damping material secured by said base member with the free end of said second cantilever beam embedded in said dampening material to limit the movement of said free end of said second cantilever beam.

4,603,986
INK PROJECTING TYPEWRITER RIBBON

George R. Simpson, 275 Central Park West, New York, N.Y. 10024

Filed Jun. 8, 1981, Ser. No. 271,378
Int. Cl.[4] B41J *31/09*
U.S. Cl. 400—241.2 **9 Claims**

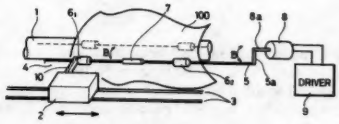
1. A colorant transfer medium for printing discrete marks on a receiving surface, said medium comprising a carrier, a colorant, and a vapor producing material responsive to the application of energy,

wherein the improvement comprises an array of a plurality of spots each including colorant and vapor producing material, wherein the vapor producing material comprises a chemically reactive material which, responsive to the application of said energy, produces a vapor by chemical reaction which rapidly propels the colorant toward the receiving surface.

4,603,987
RECORDING MEMBER PRESSING DEVICE IN A PRINTER

Masaaki Kuranishi; Susumu Nonaka, both of Yamatokoriyama; Koichi Furukawa, Kashihara, and Fumio Siozaki, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 20, 1985, Ser. No. 703,595
Claims priority, application Japan, Feb. 20, 1984, 59-31009
Int. Cl.[4] B41J *13/036, 13/20*
U.S. Cl. 400—639.1 **9 Claims**



1. In a printer including a platen rotatably provided around a first axis and a plurality of recording member pressing rollers rotatably provided around a second axis parallel with the first axis in which a recording member is forwarded to a printing position around the platen faced with a printing head and is pressed on the platen by the recording member pressing rollers, said recording member pressing rollers being movable into and out of a recording member pressing position, a recording member pressing device comprising:

memory means for storing location information of at least one of the pressing rollers as a function of the size of the recording member;

recording member size detecting means for detecting the size of the recording member;

read-out means responsive to the recording member size detecting means for reading out the location information stored in said memory means; and

locating means responsive to the read-out means for slidably moving the at least one of the pressing rollers along the second axis and setting the said pressing rollers into the said pressing position.

4,603,988
ATTACHING DEVICE FOR A PLATEN BODY IN A PRINTER

Hideaki Takenoya, and Fumiyuki Mishima, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

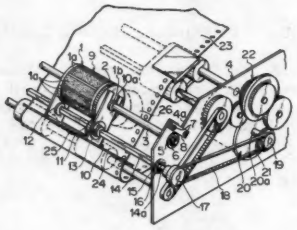
Filed Jun. 7, 1984, Ser. No. 618,212
Claims priority, application Japan, Jun. 17, 1983, 58-92113[U]
Int. Cl.[4] B41J *27/02*
U.S. Cl. 400—649 **3 Claims**

1. An attaching device for a platen body of a printer of the type in which the platen body having two ends is mounted on a platen shaft and arranged opposite to a printing head and the platen shaft is extended between two spaced frames and the platen body has ink containing elements of different colors of the ink and is shiftable along the platen shaft together with the printing head while the platen body is rotatable about the platen shaft for changing a color of printing with a printing paper being transported between the printing body and the

printing head so that the printing head may hit the platen body via the printing paper, the attaching device comprising:

(a) a guide shaft (**14**) extended in parallel with said platen shaft between said spaced frames and being rotatable;

(b) guide means (**10**) including a U-shaped guide member mounted on said guide shaft and being shiftable therealong, said U-shaped guide member having a pair of arms arranged opposite to each other and engaging said two ends of said platen body, each of said arms having an end formed with a first groove (**10***a*) opened at said end of



each arm, said platen shaft being received in one of said grooves at each end of said platen body;

(c) a gear (**2**) secured to one end of said platen body; and

(d) a drive gear (**11**) mounted on said guide shaft for rotation therewith and connected to one arm of said U-shaped guide member, said drive gear engaging said gear secured to one end of said platen body;

(e) each of said frames having a second groove (**4***a*), said second groove being opened at one end thereof, said platen shaft being received also in said second grooves.

4,603,989

COSMETIC CONTAINER CONSTRUCTION

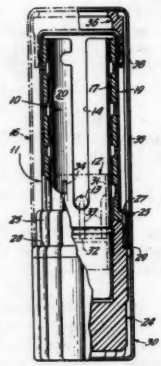
Walter T. Ackerman, Watertown, and Edward F. Klimeck, Waterbury, both of Conn., assignors to Risdon Corporation, Naugatuck, Conn.

Continuation-in-part of Ser. No. 538,908, Oct. 4, 1983, Pat. No. 4,514,102. This application Feb. 19, 1985, Ser. No. 702,620

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.⁴ B43K *21/08, 23/00*

U.S. Cl. 401—78 **18 Claims**



1. In a swivel lipstick or the like container wherein a central carrier member has a cam follower engaged to propulsion cams of inner and outer tubular members which are relatively rotatable to develop propel/repel displacement of the carrier member, the improvement wherein the inner tubular member is of metal and has a radially outward circumferential formation between an elongate upper propulsion-cam portion and a lower cylindrical base portion, wherein a molded-plastic adaptor member includes a deformable cylindrical skirt in axially overlapped permanent assembly to said circumferential formation to thereby define a plastic base shoulder of said inner tubular member, wherein the outer tubular member includes a sleeve of molded plastic with an elongate bore having a cam formation in running clearance with the upper portion of said inner tubular member, and wherein the outer tubular member integrally includes a radially outward flange having a lower surface in thrust-bearing engagement with said base shoulder, and a cylindrical metal collar having a bore in force-fitted radially squeezing assembly to the outer surface of said cylindrical skirt and thus also to the inner tubular member, said collar including at its upper end a radially inward flange in axially locating relation with the upper surface of the flange of said outer tubular member.

4,603,990

MECHANICAL PENCIL WITH REFILL CARTRIDGE

Ken Yamamoto, Kawagoe, Japan, assignor to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Jul. 11, 1983, Ser. No. 512,538

Claims priority, application Japan, Oct. 15, 1982, 57-156911[U]

Int. Cl.⁴ B43K *21/00, 21/20*

U.S. Cl. 401—85 **5 Claims**

1. A mechanical pencil having an outer pipe with forward and rearward portions, said outer pipe having a bore formed with a first inside height and diameter and a bore formed with a second inside diameter, said second inside diameter being constricted to a diameter smaller than said first inside diameter to facilitate ease of loading of replacement cartridges, the pencil comprising a lead feed mechanism fitted in the outer pipe, a lead guide connected to the lead feed mechanism and having an abbreviated cylindrical cartridge reception bore of a height and diameter which is practically the same as the bore formed with the first inside diameter of the outer pipe and having a beveled receiving lip, and a cylindrical cartridge slidably mounted from the rearward portion of the outer pipe and adapted to be detachably fitted in a telescoping relationship within the cartridge reception bore of the lead guide to present a continuous supply of leads to said lead guide and having a friction fit with the rearward portion of the outer pipe to maintain the cartridge securely and operably within the pencil, said cartridge having an outside diameter which is practically the same as the second inside diameter of the outer pipe and the inside diameter of the cartridge reception bore to provide a close fit between the cartridge and the outer pipe and being axially detachable from said outer pipe by moving the same in an axial direction with respect thereto.

4,603,991

CONNECTOR FOR PROPELLING PENCIL

Ken Yamamoto, Saitama, Japan, assignor to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Aug. 10, 1982, Ser. No. 406,965

Int. Cl.⁴ B43K *21/24*

U.S. Cl. 401—86 **2 Claims**

1. A mechanical pencil comprising:

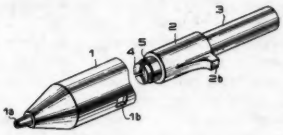
an outer cylinder (**1**) of a unitary cylindrical synthetic resin-molded structure having at least one engaging hole (**1***b*)

formed in the wall of the front portion thereof and a form suitable for being gripped between a user's fingers;

a lead pipe (3) slidably contained within the outer cylinder (1);

a lead chuck (4) fixed to the extremity of the lead pipe (3);

a chuck fastening tube (5) movably fitted on the head of the lead chuck (4);



an engaging member (2) adapted to abut the rear end of the chuck fastening tube (5) to restrict the movement of the chuck fastening tube (5); and

a spring disposed resiliently between an inner flange (2*a*) formed in the extremity of the engaging member (2) and the lead pipe (3); wherein

at least one protrusion (2*b*) for engaging the engaging hole (1*b*) is formed in the periphery of the rear portion of the engaging member (2).

4,603,992

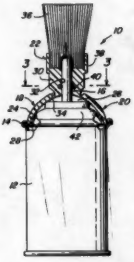
AEROSOL SHAVING BRUSH

James P. Kavoussi, 1401 80th St., Brooklyn, N.Y. 11228

Filed Jan. 23, 1985, Ser. No. 694,140

Int. Cl.[4] A46B *11/02*

U.S. Cl. 401—190 **2 Claims**



1. An aerosol shaving brush attachment for conventional aerosol shaving cream container having a top rim and a shaving cream dispensing nozzle therein, said attachment comprises:

(a) a housing having a lower portion and an upper portion, said lower portion defining a dome-like member having a hollow chamber therein with edge of said dome-like member being proportioned to engage and remain in complete contact with said top rim of said container for removably mounting said housing on said container, whereby said hollow chamber of said dome-like member of said housing completely covers the top of said container at all times during installation and use preventing dirt and dust from entering thus keeping said nozzle in a sanitary condition, said upper portion defining a complete cylindrical member having a vertical aperture therethrough to receive said nozzle of said container, said cylindrical member having a lower annular groove at the junction with said dome-like member allowing said cylindrical member to manually flex said nozzle in any angular direction to dispense shaving cream from said container while the dome-like member remains onto said top rim; and

(b) a plurality of brush bristles secured to and projecting from the top of said cylindrical member adapted to receive said shaving cream from said nozzle of said container into interior of said brush bristles.

4,603,993

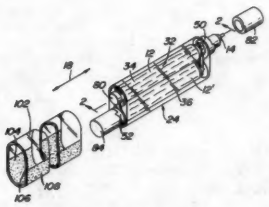
INFORMATION REEL SYSTEM

Hae-Ryong Jung, 3230 Brookmede Rd., Ellicott City, Md. 21043

Filed Dec. 5, 1984, Ser. No. 676,801

Int. Cl.[4] B43K *29/00;* **G09F** *3/00*

U.S. Cl. 401—195 **19 Claims**



1. An information reel system for displaying information contained therein, comprising:

(a) a longitudinally extended substantially transparent housing;

(b) sheet material having opposing surfaces with informational indicia formed thereon;

(c) upper reel means extending in said longitudinal direction and rotatably coupled to said housing;

(d) lower reel means extending in said longitudinal direction and rotatably coupled to said housing, each of said upper and lower reel means including a respective upper and lower sheet attaching axle member, each of said axle members being secured to one end of said sheet material, said axle members being rotatively displaceable; and,

(e) means for coupling said upper and lower reel means each to the other for (1) providing a predetermined rotational displacement of each of said upper and lower reel means responsive to a predetermined rotational force applied to at least one of said upper and lower reel means, and, (2) longitudinally restraining displacement of each of said upper and lower reel means, said means for coupling including a pair of polygonally contoured reel axle members matingly insertable within said respective sheet attaching axle members and a pair of spring members adapted to matingly engage a respective reel axle member and being laterally deformable responsive to said predetermined rotational force to provide said predetermined rotational displacement of said upper and lower reel means.

4,603,994

BALL-HOLDER OF A BALL-POINT PEN

Yoshinobu Mitsuda; Tai Inami, and Koji Mori, all of Soka, Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,260

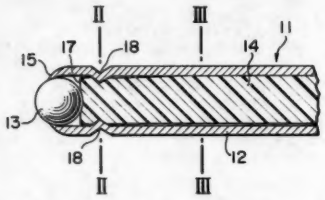
Claims priority, application Japan, Apr. 30, 1981, 56-62732[U]

Int. Cl.[4] B43K *7/00, 7/10*

U.S. Cl. 401—209 **10 Claims**

1. A ball-holder of a ball-point pen, comprising: a metallic tube having a reduced diameter portion at one end thereof, a writing ball rotatably held in the reduced diameter portion, and a synthetic resin rod inserted into the said metallic tube so as to form a ball seat at one end thereof, said metallic tube having two inward projections which hold the rod therebetween and two expanded portions expanded in opposite directions to each other along an imaginary line perpendicular to an

imaginary line connecting the two inward projections, the inward projections and the expanded portions being positioned



close to the ball seat and being formed by press-deforming of the metallic tube from two opposite directions.

4,603,995

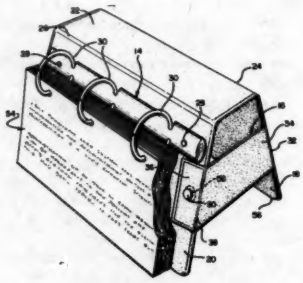
EASEL BINDER

James J. Vilona, Campbell, Calif., assignor to John S. Fosse, Woodstock, Ill.

Filed Jan. 24, 1985, Ser. No. 694,619

Int. Cl.[4] B42D *3/00, 3/16;* **B42F** *13/00*

U.S. Cl. 402—73 **6 Claims**



1. A binder for books and the like comprising: a rigid front cover panel; a rigid back cover panel; a rigid spine panel hingedly connected to said front cover panel and to said back cover panel; page-mounting means secured to the inside of a selected one of said cover panels; brace means hingedly connected adjacent one of the top and bottom edges of a first one of said cover panels and including a rigid, swingable medial panel of trapezoidal shape and and end panel hingedly connected to the otherwise free end of said medial panel; first fastener means mounted on said end panel; and second fastener means cooperatively, releasibly interengageable with said first fastener means, mounted on the inside surface of a second one of said cover panels, whereby said front, back and spine panels may be reversibly configurated into pyramidal form for use as an easel and said fastener means engaged to preserve said pyramidal form.

4,603,996

STRUCTURE FOR TEE JOINT

Kuang P. Chen, No. 1, Lane 189, Sec. 6, Yen Ping N. Rd., Taipei, Taiwan

Filed May 21, 1985, Ser. No. 736,611

Int. Cl.[4] F16B *7/00*

U.S. Cl. 403—7 **1 Claim**

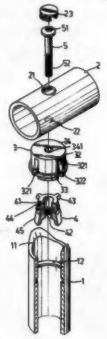
1. A structure for a tee joint comprising:

a bolt;

a first tube member with one end shaped to form a saddle-shaped recess, and being internally provided with an annular groove near said recessed end;

a second tube member provided with a first hole and a second hole for passing said bolt, the connecting line of the centers of said two holes vertically passing the central axis of said second tube member, the first hole being greater in diameter than the second hole, said recessed end of said first tube being shaped to fit the contour of said second tube member;

a substantially cylindrical housing formed by resilient material, with one end opened and the other end closed, said closed end being centrally provided with an aperture for passing the front end of said bolt, said housing being peripherally provided with a substantially annular external flange formed as an integral part of said housing, the shape and size of said flange corresponding to said annular groove, said housing being further provided with four equidistantly spaced narrow slots axially extending a length from one opened end, the outer diameter of the unflanged major portion of said housing corresponding to the inner diameter of the ungrooved major portion of that interior of said first tube member, said first tube member and said housing being such that the latter can be deformably and resiliently pushed into the former in position so that the latter's flange fits into the former's groove;



a substantially frustal plug member having a smaller top end and a bigger bottom end, centrally provided with a bore which is at least partly internally threaded for engaging with said bolt, the top end of said plug member being provided with four equidistantly spaced protuberences corresponding to said slots and which can be axially guided in the latter, said protuberance extending radially a length corresponding to the thickness of the substantial portion of the top end of said plug, the top end of said plug having an outer diameter smaller than the inner diameter of said housing, while the bottom end of said plug having an outer diameter slightly greater than the inner diameter of the housing, the height of said plug being such that the whole plug can be received inside said housing;

the structure being characterized in that at least two opposite grooves are provided with retaining means cooperating with the corresponding protuberances to hold said plug and said housing together, said retaining means comprising check means provided at the entry end of the corresponding slots which make the entry portion of a slot slightly narrower than the remaining portion thereof, and that each of said protuberances has a trapezoidal section and axially tapers toward the top end of said plug member.

4,603,997

SUPPORT RING FOR A TORSIONAL VIBRATION BALANCER WHICH CAN BE FASTENED TO A SHAFT

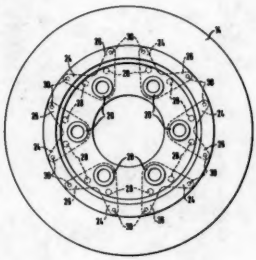
Werner Hundt, Munich, and Bernd Wagner, Höhr-Grenzhausen, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

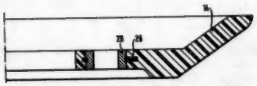
Filed Feb. 4, 1985, Ser. No. 697,844

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403858

Int. Cl.⁴ F16D *1/00*

U.S. Cl. 403—228 **19 Claims**





1. Support ring assembly, comprising a support ring formed of synthetic material to be fastened on a shaft for a balancer of torsional vibrations, said support ring having lateral surfaces and a plurality of openings formed therein, and a plurality of metal fastening bushings disposed in said openings, sand bushings having end surfaces aligned with said lateral surfaces, said bushings being distributed about said support ring along a circle, and said bushings including means for locking said bushings into said support ring, said locking means being in the form of at least one wing-shaped outwardly-directed projection each having a relatively large area as compared to the remainder of said bushing.

4,603,998

SHAFT CONNECTION MECHANISM

Helmut Bober, Neunkirchen-S.; Theo Buthe, Lohmar; Karl Coenen, Hennef; Norbert Fartmann, Siegburg; Klaus Herbertz, Lohmar-Algert; Franz-Heinz Koch, Hennef-Happers.; Horst Kretschmer, Cologne; Clemens Nienhaus, Lohmar; Peter Schardt, Neunkirchen-S.; Jürgen Schibrowski, Lohmar, and Willi Schmandt, Siegburg, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,291

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340130

Int. Cl.⁴ F16B *7/00*

U.S. Cl. 403—322 **5 Claims**

1. A shaft connection mechanism particularly for securing a slip-on hub to the power takeoff shaft of a tractor comprising:

spline means interposed between said slip-on hub and said power takeoff shaft;

radial apertures formed in said slip-on hub;

blocking members guided radially in said radial apertures;

groove means in said power takeoff shaft adapted to have said blocking members engage therein;

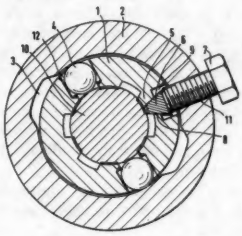
a control ring supported on said slip-on hub, said control ring having pockets for receiving therein said blocking members;

a peripheral spring interposed between said slip-on hub and said control ring, said control ring being supported on said slip-on hub against the force of said peripheral spring so as to be rotatable relative thereto to a limited extent;

an axially extending groove formed in said slip-on hub, said groove having a trapezoidal configuration which widens radially outwardly of said hub and which is open toward the inside of said hub;

a radial bore extending radially from said groove outwardly of said hub;

a threaded bore in said control ring arranged to be angularly aligned with said radial bore in said slip-on hub when said



pockets in said control ring are angularly unaligned with said blocking members;

a clamping wedge having a trapezoidal configuration generally conforming to the configuration of said axially extending groove, said wedge being engaged within said groove; and

a pressure screw threadedly engaged within said threaded bore and operative to place said control ring in locked position by engagement against said clamping wedge when said threaded bore is angularly aligned with said radial bore in said hub.

4,603,999

APPARATUS FOR MIXING AND SPREADING COATINGS ON SURFACES

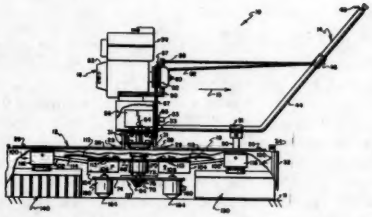
Alexander Laditka, #C-10 4741 Dalebridge Rd., Warrensville Hts., Ohio 44128

Continuation-in-part of Ser. No. 408,484, Aug. 16, 1982, Pat. No. 4,477,203. This application Sep. 16, 1983, Ser. No. 532,742

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.⁴ E01C *19/22*

U.S. Cl. 404—112 **14 Claims**



1. A manually translated rotary tool apparatus for forming a coating composition on a traffic surface by mixing and spreading previously applied ingredients deposited thereon and for smoothly spreading the same thereover irrespective of the lateral traffic surface dimensions, comprising:

a frame having vertically directed thrust bearing means about a vertical axis of rotation,

power drive means carried on the frame means on the upper

side thereof and including a drive shaft extending through said bearing to the frame underside,

carriage means disposed about said axis and including a thrust bearing receiving said drive shaft for supporting the frame and drive means thereby, said carriage means including a plurality of ball wheels providing traffic surface support thereby to permit manual translation of said apparatus in any lateral direction with respect to the traffic area undergoing treatment,

a plurality of tool arms connected to and extending radially from said shaft,

a surface-engaging tool connected to each said arm at its distal end whereby said tools will rotate in a horizontal plane upon rotation of said drive shaft by said power means thereby to effect treatment of the traffic surface,

means mounting each said tool arm for pivotal motion in a vertical plane with respect to said drive shaft and with respect to said tool connected thereto to accommodate irregularities in the treated surface while maintaining the orientation of the tool with respect thereto as said tool arms undergo pivotal vertical motion during orbiting rotation, and,

means yieldably biasing said tool arms downwardly to maintain said tool in contact with the treated surface.

4,604,000

METHOD FOR REMOVING SLUDGE OR MUD FROM THE BOTTOM OF A WATER AREA

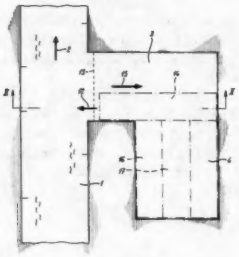
Reijer N. van Weezenbeek, Torenweg 14, 3535 NS Rockanje, Netherlands

Filed Mar. 16, 1984, Ser. No. 590,463

Claims priority, application Netherlands, Mar. 18, 1983, 8300990

Int. Cl.[4] E02F *3/88*

U.S. Cl. 405—52 **7 Claims**



1. Method for removing mud deposited upon the bottom of a water area in which flow, if occurring, at least temporarily is slight or absent, such that solid particles present in the water are deposited in the form of a layer which in times of flow is substantially maintained, which mud layer is removed by making use of water jets, said method comprising liquidizing the mud layer by means of jet nozzles inserted directly into the mud layer only to an extent sufficient to make a thick liquified flowable pulp of the mud but insufficient to cause the mud to again mix with upper layers of the surrounding water, with the water leaving said nozzles is transferred into a thick liquefied condition that the mud substance liquefied in this way being capable of flowing under the influence of its difference in specific mass with respect to the water; flowing the liquidized mud towards a place at a level lower than the upper limit of the mud layer and preferably at the level of the original bottom or lower, at which place a mud carrying flow exits or is generated.

4,604,001

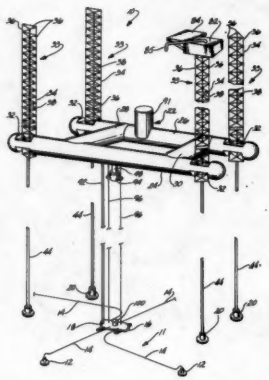
JACKDOWN TENSION LEG PLATFORM

Sherman B. Wetmore, Westminster, Calif., assignor to Global Marine Inc., Houston, Tex.

Filed Mar. 8, 1984, Ser. No. 587,591

Int. Cl.[4] B63B *21/50*; B63C *11/34*; E02B *17/08*; E21B *7/128*

U.S. Cl. 405—224 **27 Claims**



1. An operations facility useful over an underwater site comprising:

a positively buoyant, fully submersible hull structure;

a plurality of connectors each disposed on the hull for movement vertically relative to the hull, each connector including means at its lower end for connecting the connector to an anchor disposed at the site; and

means coupled between the hull and the connectors at the hull for moving each connector to attach the lower end with the anchor and thereafter for moving the hull downwardly along the connected connectors to submerge the hull to a desired depth wholly below the water surface and to tension the connectors.

4,604,002

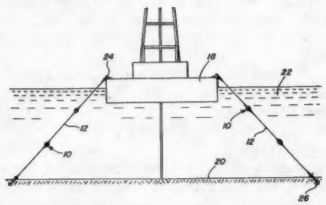
PENDANT LINE CONNECTING LINK

Archie J. Lowery, Marrero, La.

Filed Nov. 10, 1983, Ser. No. 550,498

Int. Cl.[4] B63B *21/50*; F16G *15/04*

U.S. Cl. 405—224 **2 Claims**



2. In combination, a plurality of lengths of wire rope each having an eye on each end thereof to enable a selected number of lengths to be connected to form a pendant line extending from a drilling barge to an anchor device in the seabed and disconnected for winding on a reel for transport and storage, a connecting link interconnecting the eye on adjacent lengths of wire rope, said connecting link comprising a pair of substantially identical U-shaped members, each having a pair of gener-

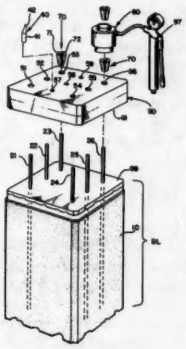
ally parallel legs and a curved web, the free end of one leg having a pair of spaced apertured lugs, the free end of the other leg including a single apertured lug received between the spaced lugs when the U-shaped members are assembled to form a generally oval-shaped link, a connecting pin extending through the apertured lugs on the free ends of the legs and a lock pin interconnecting the connecting pin and at least one of the U-shaped members, said lugs having parallel surfaces with the single lug substantially filling the space between the pair of spaced lugs, said connecting pin including a peripheral groove adjacent each end thereof, said lock pin being received in a hole extending through the single lug in perpendicular relation to the aperture through the lug, the central portion of the hole intersecting the central portion of the aperture and in registry with the groove in the connecting pin, said lock pin having a central portion received in said groove in the connecting pin thereby retaining the connecting pin assembled with the lugs, said hole in the single lug being adjacent the juncture of the single lug and leg with the central portion of the hole including a continuous surface engaging the central portion of the lock pin opposite to the surface of the lock pin received in the groove for providing continuous support for the lock pin in opposed relation to the connecting pin, said lock pin being a longitudinally split tubular pin of resilient material having a diameter slightly larger than the hole for frictional, self-locking retention of the lock pin in the hole, said single lug having a thickness substantially less than the thickness of the free end of the leg to form shoulders at the inner end of the single lug, said pair of lugs having remote outer surfaces generally flush with the outer surfaces of the leg, said pair of lugs having a constant thickness substantially the same as the width of the shoulders, the innermost surfaces on the pairs of lugs being spaced apart with the portion of the connecting pin extending between the innermost surfaces on the pairs of lugs being completely exposed, the radius of curvature of the inner surface of the web being slightly larger than one-half the distance between the innermost surfaces on the pair of lugs, the free ends of the pair of lugs being disposed closely adjacent to the shoulders and the free end of the single lug being disposed closely adjacent the portion of the leg between the pair of lugs.

4,604,003

METHOD AND APPARATUS FOR RETENSIONING PRESTRESSED CONCRETE MEMBERS

Ronald A. Francoeur, 59 Elm St., Salisbury, Mass. 01950, and Verne L. Schellhorn, P.O. Box 199, 32987 Highway 1 South, Gualala, Calif. 95445

Continuation of Ser. No. 437,899, Feb. 22, 1983, abandoned.
This application Jun. 27, 1985, Ser. No. 750,047
Int. Cl.[4] E02D *5/10*; E04C *3/26, 5/08*
U.S. Cl. 405—256 **13 Claims**



1. A method of retensioning the development length of pre-tensioned strands embedded in and bonded to the concrete of an elongated, prestressed concrete member comprising the steps of:

(1) exposing any unexposed ends of said pre-tensioned strands at one end of the prestressed concrete member,

(2) covering said one end of said concrete member with a plate having holes therein through which the ends of said pre-tensioned strands can pass,

(3) applying retaining wedges between the ends of said pre-tensioned strands and said plate, and

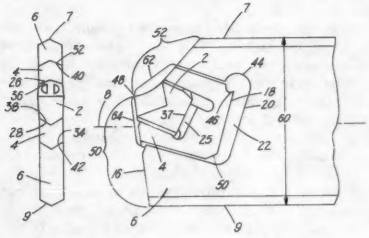
(4) retensioning each pre-tensioned strand by applying a predetermined amount of tension to the end of each such strand and maintaining said tension between the end of said pre-tensioned strand and said plate by said retaining wedges.

4,604,004

CUTTING TOOL ASSEMBLY

William D. Armbrust, Cary, N.C., assignor to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 356,833, Mar. 10, 1982, abandoned.
This application Dec. 3, 1985, Ser. No. 805,246
Int. Cl.[4] B26D *1/00*
U.S. Cl. 407—110 **26 Claims**



1. A cutting tool assembly comprising: a hard wear resistant insert having a forward cutting portion, a shim and a blade body having a longitudinal axis, said shim having a rearwardly extending recess for receiving said insert, said insert resting against the rear portion of said shim recess, said shim recess tapering toward the open end of said shim recess to springingly hold said insert, said blade body having a downwardly and rearwardly extending recess on a first end for receiving said shim and insert, said blade body recess also being inclined to said longitudinal axis of said blade body, said blade body recess tapering toward said blade body to wedgingly hold said shim and insert.

17. A shim and insert for use in a cutting tool assembly comprising: a hard wear resistant insert and a shim, said insert having a forward cutting portion, a seating portion directly opposed to said cutting portion, an upper peripheral edge and a lower peripheral edge; said shim having an upper arm of substantially uniform cross section and a rearwardly extending recess for receiving said insert, said recess having an upper portion, a lower portion and a rear portion; the upper and lower portions of said shim recess engaging the upper and lower peripheral edges, respectively, of said insert, said recess tapering the open end of said recess to springingly hold said insert, said shim having a longitudinal slot extending rearward of said recess, and when said shim and insert are fully engaged, the seating portion of said insert rests against the rear portion of said shim recess, said shim having a land portion of reduced cross sectional thickness rearward of said rear portion of said shim recess, said land being the bottom of a notch formed between said shim and said seating portion of said insert when said shim recess receives said insert.

4,604,005

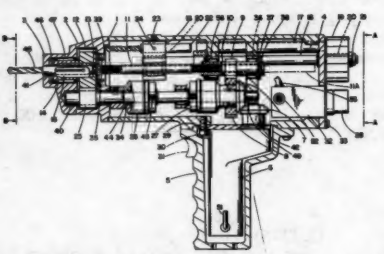
PORTABLE SELECTOR DRILL

Norman Russ, Box 508, Norwich, Conn. 06360

Filed Feb. 8, 1985, Ser. No. 699,906

Int. Cl.[4] B23B *45/00*

U.S. Cl. 408—35 **4 Claims**



1. An electrically energizable portable drilling device comprising:

a frame defining a handle portion and including a hollow housing body with a front and rear end,

an electrically energizable motor in said frame and having an output shaft,

a collet chuck rotatably supported in said frame at the front end of said housing body for rotation on a central axis,

an elongated ram reciprocably mounted in said frame and oriented in axial alignment with said central axis of said rotatably mounted collet chuck for movement between rearward and forward positions,

drive means provided between said motor output shaft and said collet chuck to rotate the latter in response to rotation of said motor output shaft,

converting means provided between said drive means and said ram to cause linear movement of said ram in at least one axial direction in response to rotation of said motor output shaft,

cartridge means rotatably mounted in said frame housing body such that one of several drill bit openings defined in said cartridge means can be aligned with said axial direction of movement of said ram and a drill bit in said one cartridge opening moved forwardly into said collet chuck by said linear ram movement said cartridge means provided between said front and rear ends of said housing body and said ram movable through said carriage opening to so position a bit in said collet chuck.

4,604,006

DRILLING MACHINE HAVING ELECTROMAGNETIC BASE

Mitihiro Shoji, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 401,984, Jul. 26, 1982, abandoned. This application Nov. 12, 1985, Ser. No. 796,530

Claims priority, application Japan, Nov. 20, 1981, 56-186473; Feb. 17, 1982, 57-23741

Int. Cl.[4] B23B *47/24*

U.S. Cl. 408—76 **1 Claim**

1. In a drilling machine having a frame, an electromagnetic base integrally mounted at the lower portion of said frame and being capable of electromagnetic fixation on a workpiece, an electric drill integrally mounted on said frame and provided with an annular cutter which is rotated by a driving motor, a power circuit for applying an electric current to the driving motor of the electric drill and the electromagnetic base, and a power switch means for actuating the power circuit, the improvement which comprises:

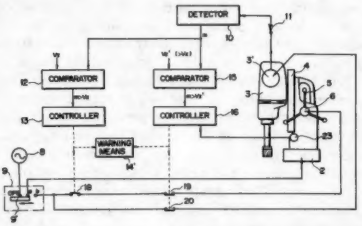
a detector means, connected to the driving motor, for detecting a load value from said electric drill;

a first control system connected to the detector means and composed of a first means for comparing the load value fed from said detector means with a prescribed first variable reference level and a first controlled means for issuing an instruction when the load value becomes larger than the first variable reference level;

a second control system connected to the detector means and composed of a second means for comparing the load value fed from said detector means with a prescribed second variable reference level higher than said first variable reference level and a second controller means for issuing an instruction when the load value becomes larger than the second variable reference level;

a single warning device connected between the first controller means and the second controller means, said warning device being actuated upon reception of the instruction issued from one of the first controller means of the first control system and the second controller means of the second control system;

a first switch means, interposed between the power circuit and the electric drill, for cutting off the supply of the electric current to the electric drill upon reception of the instruction issued from the second controller means of the second control system;



an automatic feed motor arranged in the frame and adapted to vertically advance the electric drill toward the workpiece;

a second switch means, interposed between the power circuit and the feed motor, for cutting off the supply of the electric current to the feed motor upon reception of the instruction issued from the first controller means of the first control system;

a change-over switch, separated from the power switch means and interposed between the electric drill and the detector means, whereby manual operation can be carried out when the change-over switch is opened;

a manually operated control handle means, attached to the frame, for vertically advancing the electric drill toward the workpiece;

a limit switch provided within the frame and connected in parallel to the second control system, said limit switch being actuated to be opened to cut off the supply of the electric current to the electric drill and the feed motor when a boring work comes to an end; and

signal means, connected in series to the limit switch and operated by an electric current fed through the limit switch, for indicating the boring work has come to the end.

4,604,007

CUTTING TOOL

Luke Hall, Missouri City, and Jerry M. Multop, Stafford, both of Tex., assignors to Progressive Technology, Inc., Stafford, Tex.

Filed Feb. 1, 1985, Ser. No. 697,205

Int. Cl.[4] B23C *1/16*

U.S. Cl. 409—89 **20 Claims**

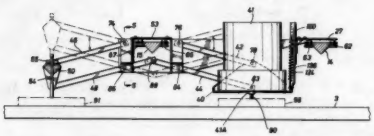
1. Shaping means for shaping a work piece, comprising cutting means for rotatably cutting said work piece,

stylus means for engaging and tracing a pattern exhibited on a paper and the like, and

support means for maneuvering said cutting means in alignment with said stylus means, including

first shorter and longer strut members each pivotally connected adjacent at one end with said stylus means,

second shorter and longer strut members each pivotally connected adjacent at one end with said cutting means, and



linking means pivotally interconnected with the other ends of said first and second shorter strut members and at points between the ends of said first and second longer strut members,

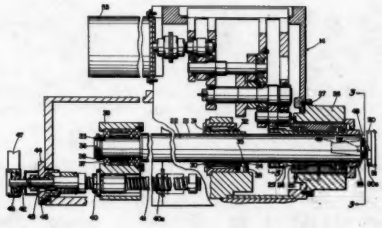
said first and second longer strut members further being pivotally and slidably interconnected adjacent the other ends thereof.

4,604,008

METAL WORKING MACHINE HAVING POLYGON TOOL SUPPORT BAR

Kendall F. Bone, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 12, 1984, Ser. No. 630,151
Int. Cl.[4] B23C *1/027*
U.S. Cl. 409—231 **5 Claims**



1. A machine tool, comprising:

a machine base;

a carrier movably supported on said base;

a cutting tool support bar journalled in said carrier for rotation about a longitudinal bar axis, said support bar being axially slidable during rotation thereof, and said support bar having

a cutting tool-receiving first surface and

a second surface of polygon cross-sectional geometry formed around said longitudial bar axis;

drive means for rotating said bar, said drive means comprising, in part, means cooperatingly formed to, and matingly engaged with, said second surface of said bar, said drive means located proximal to a carrier face defining a point of exit of said bar with respect to said carrier, and

means for axially moving said bar with respect to said drive means and said carrier;

wherein said polygon cross-sectional-geometry of said second surface comprises

a center, coincident with said longitudinal bar axis;

a closed perimeter formed, in part, by a plurality of symmetrically spaced, identical, curved segments, at least one of said segments having a radius-of-curvature extending to the segment from a point of origin spaced from said center; and

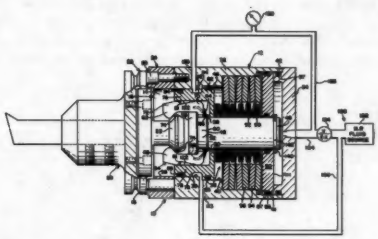
a pressure angle at the point of contact of said second surface with said drive means during rotation, said pressure angle having a tangent value greater than the coefficient of friction between said second surface of said cutting tool support bar and said drive means.

4,604,009

TOOL RETENTION MECHANISM

M. Richard Tennerstedt, Wilmette, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 12, 1985, Ser. No. 754,098
Int. Cl.[4] B23C *5/26*
U.S. Cl. 409—233 **10 Claims**



1. A tool retention mechanism for clamping a tool holder knob, comprising a housing having an internal compartment communicating with an opening through said housing, a rod member supported lengthwise in said compartment and having its outer end disposed ajacent said housing opening, knob clamping assembly including a circular array of claw fingers pivotally mounted on said outer end of said rod member and moveable between an open position and a knob clamping position, first piston means slidably disposed in said compartment for movement between a retract position and an extend position, said first piston means including finger engaging means for retaining claw fingers at said knob clamping position when said first piston means moves to said extend position, second piston means for moving said rod member lengthwise of said comparment between a load and unload positions, first spring bias means for exerting a force on said rod member away from said housing opening, second spring bias means for exerting a force on said finger engaging means towards said housing opening, and fluid control means for selectively driving said second piston means from said load position to said unload position to overcome the force exerted by said first spring bias means and for driving said first piston means from said extend position to said retract position to overcome the force exerted by said second spring bias means, and for selectively releasing the driving force on said second piston means to permit said first bias means to return to said retract position and for releasing the driving force on said first piston means to permit said second spring bias means to return said knob clamping assembly to said knob clamping position.

4,604,010

DRAW BAR TYPE FLANGE MOUNTED TOOL HOLDER

Derek G. Reeves, LaSalle, Canada, assignor to VSI Corporation, Pasadena, Calif.

Filed Jul. 26, 1984, Ser. No. 634,531
Int. Cl.[4] B23B *31/02*; B23Q *3/12*
U.S. Cl. 409—233 **2 Claims**

1. A tool holder for use with a mounting system including a spindle having a central axial bore and a draw bolt positioned centrally in the upper end of the spindle bore, said holder comprising:

A. a central main body portion;

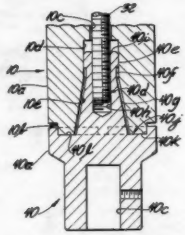
B. a lower portion extending fixedly downwardly from said central main body portion and including attachment means for central coaxial receipt of the shank of a suitable tool;

C. means defining an annular recess in the upper end of said main body portion for seating coaction with a pilot portion on the lower end of the spindle;

D. a reduced diameter neck portion extending fixedly upwardly from said upper end of said central portion, concentrically within said annular recess, sized to pilot upwardly into the central bore of the spindle and having a threaded central bore opening at the upper end of said neck portion for threading coaction with the lower end of the draw bolt;

E. said reduced diameter neck portion being frusto-conical and tapering inwardly toward the upper end thereof;

F. said tool holder being for use with a spindle whose central axial bore includes a lower frusto-conical portion tapering outwardly toward an opening in the lower face of the spindle and having a taper approximating that of said neck



portion of said tool holder and the diameter of said neck portion at its base being less than the diameter of the frusto-conical lower portion of the spindle bore at the lower face of the spindle, whereby, with the pilot portion of the spindle seated in said recess in said upper end of said central main body portion, an annular space remains between the confronting frusto-conical surfaces on the tool holder neck portion and on the spindle;

G. said annular recess comprising an annular groove in said upper end of said central main body portion having its inner radius defined by the base of said neck portion and its outer radius defined by a generally axially extending annular shoulder surface concentric with said axis; and

H. the central axial bore of the spindle further including an upper cylindrical portion having a diameter approximating the diameter of the upper end of the lower frusto-conical portion of the spindle central bore and said reduced diameter neck portion including a cylindrical head portion at the upper end thereof sized to pilot upwardly into the cylindrical portion of the central axial bore of the spindle.

4,604,011

METHOD AND APPARATUS FOR EDGE-PLANING SHEET METAL

Helmut Rungger, Roitham; Erwin Fuchs, Altmünster, and Johann Knoll, Schörfling, all of Austria, assignors to Dr. Techn. Ernst Linsinger & Co. GmbH, Steyrermühl, Austria

Continuation of Ser. No. 485,416, Apr. 15, 1983, abandoned.

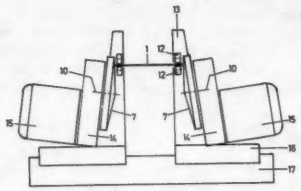
This application Nov. 5, 1985, Ser. No. 794,966

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304201

Int. Cl.[4] B23C *3/12*

U.S. Cl. 409—138 **6 Claims**

4. An apparatus for machining a work piece of sheet or sheet-like configuration by means of cutting elements disposed on rotating milling tools, comprising a conical tool having a conical angle α in the range of about 150° to about 180° and including a jacket, cutting elements disposed on said jacket of said conical tool such that each cutting element engaging said work piece is located in the plane of machining, and the axis of



said conial tool is inclined by a relatively small angle δ about an axis perpendicular to the plane of the work piece.

4,604,012

TOOL CLAMPING DEVICE FOR A SPINDLE HEAD

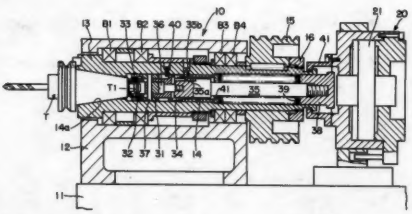
Hisamitsu Kawasaki, Kariya, and Yukio Kato, Nagoya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 25, 1984, Ser. No. 573,619

Claims priority, application Japan, Feb. 3, 1983, 58-16615

Int. Cl.[4] B23B *31/26, 31/10*

U.S. Cl. 409—233 **3 Claims**



1. A tool clamping device used in a machine tool for clamping on a tool spindle a tool holder being inserted into a tapered bore of said tool spindle, by pulling a pull stud of said tool holder, comprising:

a guide bush slidably received in a through bore formed in said tool spindle for movement in an axial direction thereof and formed with an annular groove at an internal surface of its front end portion close to said tapered bore;

a hollow retainer slidably received in the bore of said guide bush for axial movement relative thereto and formed at its front end portion close to said tapered bore with a plurality of ball retaining holes extending in the radial direction;

a plurality of balls retained in said ball retainer holes for allowing said pull stud to come into and go out from a bore of said retainer when said ball retaining holes face said annular groove, but for preventing said pull stud from going out from the bore of said retainer when said ball retaining holes face the internal surface of said guide bush other than said annular groove;

drive means including a single actuator for forwarding and retracting said guide bush within said through bore, a connecting member received in the bore of said retainer and axially movable relative thereto, a pin extending through an axial slot formed in said retainer and integrally connecting said connecting member and said guide bush, a draw bar coupled to said connecting member and movable back and forth in an axial direction thereof within the through bore of said tool spindle, and draw bar drive means including said single actuator for forwarding and retracting said draw bar in the axial direction thereof;

engagement means for enabling said retainer to be retracted together with said guide bush when said guide bush is further retracted from the state in which said ball retaining

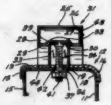
holes face the internal surface of said guide bush other than said annular groove; and

position control means for preventing retraction of said retainer until said ball retaining holes are brought into such a state as to face the internal surface of said guide bush other than said annular groove, but for allowing reraction of said retainer when said retainer is enabled by said engagement means to be retracted together with said guide bush, including a spring for pushing said retainer in the forward direction, and a stopper fixed in said tool spindle for regulating the forward end position of said retainer.

4,604,013
VEHICLE SIDE RAIL ASSEMBLY

Dennis L. Elwell, Johnston, and Robert L. Sills, Polk City, both of Iowa, assignors to Dee Zee Manufacturing, Des Moines, Iowa

Filed Jan. 14, 1985, Ser. No. 691,414
Int. Cl.[4] B60P *7/06*
U.S. Cl. 410—106 **7 Claims**



1. A side rail assembly for attachment to a side panel of a pick-up truck or like vehicle, the side panel having an upper wall with at least one opening formed therein for attachment purposes, the side rail assembly comprising:

(a) tread plate means formed to fit over the side panel upper wall and having at least one opening adapted to register with at least one of the respective upper wall openings;

(b) side rail means having a center portion spaced from said tread plate means;

(c) spacer means disposed between said tread plate means and side rail means in nested engagement with said side rail means whereby said spacer means and side rail means are locked together against relative rotational movement about a common axis; and

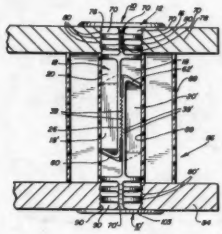
(d) means insertable through said registered openings for fastening said tread plate means, side rail means and spacer means together and to the side panel upper wall.

4,604,014
PALLET FASTENER

Francis G. Frano, Hoffman Estates, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 12, 1984, Ser. No. 630,157
Int. Cl.[4] F16B *21/07, 21/08*
U.S. Cl. 411—338 **14 Claims**

1. A two-part fastener made of resilient material comprising a pair of identical fastening devices, each of said fastening devices including a head and shank, said shank having an elongate symmetrically-shaped body having a longitudinal central axis, said shank intergally formed at one end with said head in a normal relation to said longitudinal axis, said shank including a pair of leg members disposed along said longitudinal axis in diametrically opposed relation to each other, each of said leg members having two relatively thin planar wall elements joined together along there radial inward edge and angularly disposed in a V-shaped configuration, the outer end portion of said leg members spaced apart laterally a distance sufficient to embracingly receive the pair of leg members of said identical fastener, and a plurality of tooth formations pointing in the direction of said head from the outer wall surface of one of said two V-shaped wall elements for each of

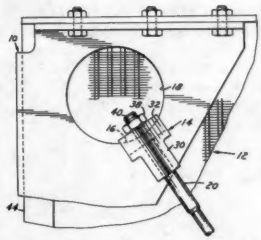


said leg members, the projection of said tooth formations from said outer wall surface being selected to cause the plurality of mating teeth to ratcher together in an interlocking relation as said pair of identical fastening devices are brought together such that the portion of each of said one of said thin planar wall elements which carry said plurality of tooth formations flex in a circumferential direction during the ratcheting action.

4,604,015
MEANS FOR RETAINING A RADIATOR RIGID

Thomas A. Lesniak, South Bend, Ind., assignor to McCord Heat Transfer Corporation, Walled Lake, Mich.

Filed Mar. 8, 1984, Ser. No. 587,424
Int. Cl.[4] F16B *43/02*
U.S. Cl. 411—537 **3 Claims**

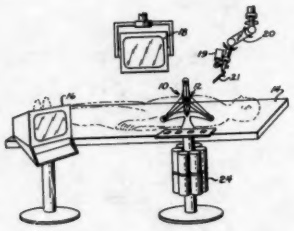


1. For use on an engine cooling radiator including sets of oppositely disposed corner gusset plates and side channels, means for retaining said radiator rigid, said means comprising an arcuate edge portion formed on each of one of said sets of oppositely disposed corner gusset plates and side channels, a sleeve mounted on each of said arcuate edge portions, each of said sleeves including a body, a longitudinal bore formed through said body, a ledge formed adjacent one end of said body, an arcuate-shaped groove formed in said ledge, said arcuate-shaped groove having a radius matching the radius of said arcuate edge portion and being slidably mounted thereon, said arcuate-shaped groove opening in a direction generally parallel to the longitudinal axis of said sleeve whereby said sleeve may be hooked over said arcuate edge to hold said corner gusset plates in tension, a rod having threaded ends extended through aligned bores of said sleeves, and a nut threadedly secured on each threaded end against said adjacent sleeve.

4,604,016
MULTI-DIMENSIONAL FORCE-TORQUE HAND CONTROLLER HAVING FORCE FEEDBACK

Stephen A. Joyce, 1163 W. Eddy, Chicago, Ill. 60657

Filed Aug. 3, 1983, Ser. No. 520,056
Int. Cl.[4] B25J 3/00
U.S. Cl. 414—7 10 Claims

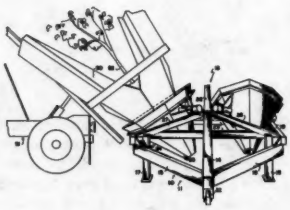


1. A controller for remotely manipulating objects including:
(a) a cursor having a line attachment member for retaining control lines in spaced relationship and a handle means connected thereto for repositioning the attachment member;
(b) a cursor support means surrounding the cursor having a plurality of means adapted to receive control lines for movement therethrough;
(c) a plurality of control lines each connected at a first end to the line attachment member and at a second end adapted for connection to a controlled apparatus, the cursor and attachment member being suspended within the cursor support means by said plurality of control lines, each line directed through the receiving means of the support means wherein movement of the cursor handle means correspondingly actuates the controlled apparatus.

4,604,017
TREE TRANSPORTER

Terrence E. Boehm, Box 201, Allan, Saskatchewan, Canada S0K 0C0

Filed Jun. 17, 1985, Ser. No. 745,073
Claims priority, application Canada, Jun. 25, 1984, 457365
Int. Cl.[4] B60P 3/00
U.S. Cl. 414—23 14 Claims

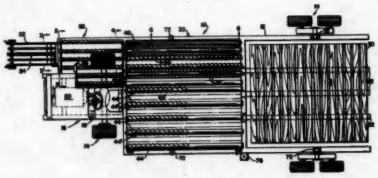


10. Apparatus for transporting trees comprising a framework having a first longitudinal beam, a second longitudinal beam, means mounting the beams in parallel spaced relation with the second on a level higher than the first and a plurality of transverse beams spaced along the length of the first and second beams so as to form a plurality of rectangular framed cells, ground wheels on which the framework can be supported for transport, a plurality of buckets each having a planar open mouth and a peripheral wall arranged to provide an axis of the bucket which lies at right angles to the plane of the mouth and shaped to receive the root section of a tree, mounting means at opposed positions on the outer surface of the peripheral wall of each bucket for mounting the bucket on the framework and mounting receiving means on the framework for receiving the mounting means of the respective bucket, the mounting receiving means having a first portion on the first beam and a second portion on the second beam at the diagonally opposite position on the cell, the mounting means being arranged on the bucket such that the bucket is pivotal relative to the mounting receiving means about a pivot axis so that the pivot axis is inclined to the plane of the mouth and passes through the peripheral wall of the bucket at two points one of which is spaced from the mouth by a greater distance than the other, so that the axis is inclined to the horizontal whereby the end of the bucket adjacent the second beam is higher than the other end and such that the axis is inclined relative to the first beam whereby the bucket can be pivoted from a loading position wherein the bucket axis faces outwardly from the first beam for receiving the tree root section to a transport position in which the bucket axis lies in a plane substantially parallel to the first and second beams.

4,604,018
HAY BALE LOADER

Marvin F. Kruse, Rte. 3, Box 178, Tecumseh, Nebr. 68450

Filed Aug. 29, 1984, Ser. No. 645,405
Int. Cl.[4] A01D 87/12; B65G 57/24
U.S. Cl. 414—44 11 Claims



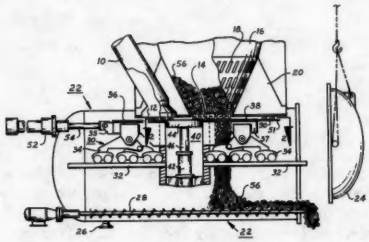
1. A machine for handling rectangular objects which is adapted to pick up hay bales individually from a field and assemble a plurality of said bales in a stack on a pallet carried thereby comprising:
a frame having a forward portion, a central portion and a rear portion, wheel means supporting said frame and directional drive means coupled thereto for movement thereof in a predetermined horizontal direction;
pick-up conveyor means mounted on the forward portion of said frame for picking up successively individual bales from a field and depositing them in forward portion of said frame;
manipulator means disposed adjacent said pick-up means for receiving each bale and for longitudinally orienting each bale selectively transverse to the direction of travel or parallel thereto;
accumulator means disposed in the central portion of said frame for receiving each bale from the manipulator means and for assembling each bale, successively, into a layer wherein each bale is disposed in a predetermined longitudinal orientation transverse or parallel to the direction of travel;
removal bale support means carried by the rear portion of said frame for successively receiving layers of bales;
carriage means movable between the rear and central portions of said frame for successively securing an assembled layer of bales on said accumulator means, raising said layer vertically, translating said layer rearwardly, lowering said layer onto said support means and holding said layer on said support means whereby a predetermined number of successive layer will be assembled on said support one on top of another in a stack and held in place as said machine moves in the predetermined horizontal direction.

4,604,019

SYSTEM FOR REMOVING SOLIDS FROM A SOLIDS UPFLOW VESSEL

Roland F. Deering, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 24, 1984, Ser. No. 633,806
Int. Cl.[4] F23K 3/00
U.S. Cl. 414—187 14 Claims



1. An apparatus for removing solids from a solids upflow vessel through a bottom solids inlet to said upflow vessel, said vessel being mounted adjacent to a solids feed chute having a solids outlet in substantially the same horizontal plane as said bottom solids inlet and spaced from said bottom solids inlet, which apoaratus comprises:

(a) a carriage positioned below said solids upflow vessel and said solids feed chute, said carriage carrying a substantially horizontal plate means for preventing flow of solids from said feed chute through said solds outlet and from said upflow vessel through said bottom solids inlet, said plate means containing (1) a first hole through which solids can be introduced into said upflow vessel through said bottom solids inlet, (2) a second hole through which solids can be removed from said upflow vessel through said bottom solids inlet and (3) a means for opening and closing said second hole, said carriage being further provided with means for movement in a horizontal direction between first and second stationary positions;

(b) carraige actuator means for horizontally reciprocating said carriage between said first and said second stationary positions;

(c) a structural means for supporting said carriage in its horizontal movement between said first and said second stationary positions; and

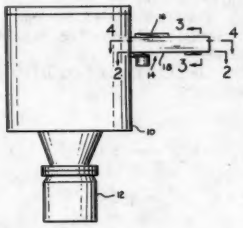
(d) means for vertically feeding solids through said first hole in said plate means into said upflow vessel through said bottom solids inlet, said feeding means being mounted on said carriage such that said feeding means is aligned with and immediately below both said first hole and the solids outlet of said feed chute while at least a portion of said second hole in said plate means is immediately below the bottom solids inlet to said upflow vessel when said carriage is in said first stationary position, and said feeding means is aligned with and immediately below both said first hole and the bottom solids inlet to said upflow vessel while a portion of said plate means is immediately below the solids outlet of said feed chute when said carriage is in said second stationary position, and wherein said second hole is located in said plate means such that when at least a portion of said second hole is immediately below the bottom solids inlet to said upflow vessel and at least a portion of said second hole is uncovered, solids can flow from said upflow vessel outside the confines of said feeding means until said upflow vessel is substantially empty of solids.

4,604,020

INTEGRATED CIRCUIT WAFER HANDLING SYSTEM

Guillermo L. Toro Lira, Mountain View, and Earl M. Jensen, San Jose, both of Calif., assignors to Nanometrics Incorporated, Sunnyvale, Calif.

Filed Mar. 26, 1984, Ser. No. 593,287
Int. Cl.[4] B25J 3/00
U.S. Cl. 414—217 3 Claims



1. In combination with a vacuum chamber, a handling system for transfering wafer discs from a position at atmospheric pressure to and from the interior of the vacuum chamber with minimum loss of vacuum from said chamber, said handling system comprising:

a sealable gate through the side wall in the vacuum chamber, said gate having a width suitable to pass a disc therethrough;

a substantially rectangular sealable exterior chamber having a sealable top door, a first end of said exterior chamber being attached and sealed to the exterior side wall of said vacuum chamber and around the opening of said gate;

a moveable disc carrier horizontally mounted on tracks in the inner walls of said exterior chamber, said tracks being aligned parallel with an axis normal to said vacuum chamber side wall at said sealable gate, said carrier having a first end section adjacent said sealable gate for supporting a wafer disc, and supporting at its second end a first magnet positioned adjacent an enclosing interior surface of a thin floor of said exterior chamber, said disc carrier including a pair of disc engaging pins located at the lead end of said disc carrier, said pins being vertically moveable by a solenoid beneath the disc carrying surface for engaging and releasing the leading edge of a disc;

a motor driven endless drive means located outside of said exterior chamber and having a linear section parallel with said normal axis, the linear section of said drive means being coupled to a second magnet located adjacent the outer enclosing surface of said thin floor of said exterior chamber, said second magnet being magnetically coupled to said first magnet for linearly moving said disc carrier along its tracks in response to corresponding movement of said drive means; and

a stage within said vacuum chamber for removing a wafer disc from the end section of said disc carrier, said stage having a disc stop with a disc contacting leading edge conforming to the shape of a disc and a pair of slots spaced to receive said pair of disc engaging pins, said stage having a pair of spaced disc engaging members moveable in slots radially extending outward at an angle from said disc stop toward said gate in response to forces exerted against a slideable member on said stage by the inward movement of the leading end of said disc carrier end section, said disc engaging member being spring biased for grasping two substantially equally spaced points on the disc periphery upon the withdrawal of said disc carrier leading end, said spring bias provided by a spring coupled between a first pulley and a stationary member on said stage, each of said engaging members being attached to a cable passing through said first pulley, a second pulley at the extreme

outward end of said slot, and to the slideable member on said stage.

4,604,021

LIFTING BEAM MANIPULATOR ASSEMBLY FOR FORGING PRESSES

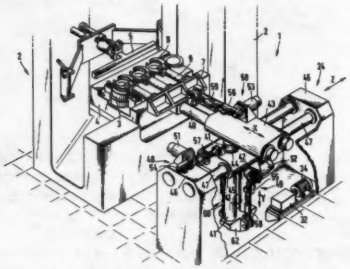
Eberhard Werner, Leverkusen, Fed. Rep. of Germany, assignor to Eumuco Aktiengesellschaft für Maschinenbau, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,733

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245317

Int. Cl.⁴ B65H *1/00*; B21D *43/10*

U.S. Cl. 414—226 **16 Claims**



1. An article handling assembly including a lifting beam manipulator for a forging press which has a plurality of work stations and a spraying mechanism for said work stations, said assembly comprising:

(a) plural workpiece grasping means for carrying workpieces;

(b) means for effecting movement of the plural workpiece grasping means, sequentially along and outside of the work stations of the forging press and for moving the plural workpiece grasping means into and out of the work stations of the forging press;

(c) means for moving the spraying mechanism into the work stations of the forging press;

(d) said movement effecting means including an individual drive assembly to separately and individually effect each movement of the workpiece grasping means along three axes of movement; and

(e) each individual drive assembly including a separate and individual transport member and a hydraulic rotary piston cylinder connected thereto to effect said movement of each transport member,

(f) the hydraulic rotary piston cylinder includes a crank arm fitted with a connecting arm, and

(g) each said crank and rod combination carries out a pivot angle of 180°.

4,604,022

TRUNK LOADING DEVICE FOR BUSINESS MACHINES AND THE LIKE

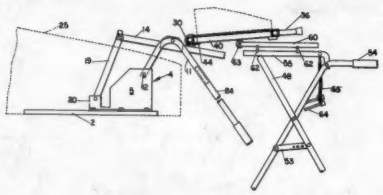
Elroy E. Bourgraf, Cincinnati, Ohio, assignor to Ferno Washington, Inc., Wilmington, Ohio

Filed Apr. 2, 1984, Ser. No. 595,978

Int. Cl.⁴ B60R *5/04*; B65G *67/00*

U.S. Cl. 414—340 **14 Claims**

1. Lifting mechanism for transferring bulky articles to and from the trunk of a vehicle, said lifting mechanism comprising a base adapted to be seated on the floor of the trunk, a lift platform overlying said base, sets of lever arms pivotally interconnected said base and said lift platform, bracket means projecting upwardly from said base on each side of said lift platform, a first set of said lever arms having angularly related linear end portions joined by a curved central portion, the lever arms in said first set being pivotally connected to said bracket means at pivot points spaced upwardly from said base and pivotally connected to said lift platform at their curved central portions, a second set of lever arms, the lever arms in said second set being linear and pivotally connected at one end to said bracket means in close proximity to said base and pivot-



ally connected at their opposite ends to said lift platform, said lift platform being movable from a storage position in which it is seated on said base to an elevated position in which the lift platform projects outwardly from the trunk of the vehicle, and detachable handle means engagable with said first set of said lever arms, whereby said first set of lever arms may be moved by said handle means to raise and lower said lift platform.

4,604,023

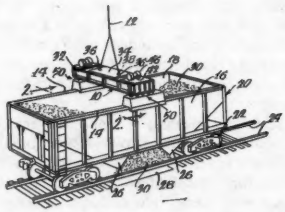
SHAKEOUT APPARATUS

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed May 31, 1984, Ser. No. 615,771

Int. Cl.⁴ B65G *67/24*

U.S. Cl. 414—375 **9 Claims**

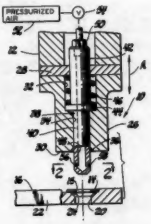


1. A shakeout apparatus for loosening material in a loaded car comprising a frame, a pair of motors mounted on the opposite end portions of said frame, at least one eccentric weight mounted on the output shaft of each motor, a pair of hammers resiliently carried by said frame, spring means suspending said hammers from said frame, means for independently driving said motors and eccentrics whereby the eccentrics will self-synchronize, said motors and eccentric weights forming a single mass system having a natural frequency close to the operating speed of said motors when said hammers are in contact with the car; said frame, spring means and hammers forming a two mass system having a natural frequency above the operating speed of the motors when said hammers break contact with the car whereby the combined alternating single mass system and two mass system produce high frequency, low amplitude vibrations in the car for loosening material in the car.

4,604,024
WASHER PICK UP AND PLACEMENT TOOL

David K. Edwards, Eaton, and John H. Kramer, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1984, Ser. No. 674,690
Int. Cl.[4] B65G 47/90
U.S. Cl. 414—592 3 Claims



1. A washer pick-up and placement tool adapted to be connected to an arm of a manipulator and to be moved from a first station where said tool picks up a washer to a second station where said tool places said washer on a shaft, said tool comprising a housing having one end thereof fixed to said arm and having a free end, a bore extending through said housing from said one end to said free end of said housing, a rod member mounted in said bore for relative sliding movement between a first position and a second position and having a portion thereof extending out of said free end of said housing, a passage formed in said rod member, a source of pressurized air connected to said passage, a pair of nozzles connected to said passage and located on opposite sides of said portion of said rod member extending out of said free end of said housing, said nozzles being angled so as to provide air flow in the form of a pair of air jets towards said free end of said housing, and means operatively connected to said rod member for maintaining the latter in said first position when said tool is at said first station so as to permit said nozzles to be inserted into a hole in said washer and cause the air flow emanating from said nozzles to strike the bottom surface of said washer to thereby lift said washer onto the rod member and be held thereon, said means serving to cause said rod member to be located in said second position when said tool is moved to the second station and the rod member is pressed against said shaft so as to locate the rod member relative to the housing whereby the air flow emanating from said nozzles is directed away from said free end of the housing to impinge upon the top surface of said washer and release the washer from the rod member and place it on the shaft.

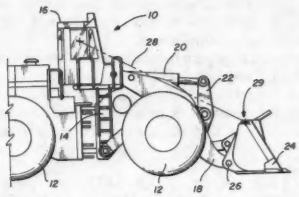
4,604,025
POSITION INDICATOR FOR A MATERIAL HANDLING ELEMENT OF A MACHINE

Ezzat A. Hammoud, Libertyville, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 9, 1984, Ser. No. 659,058
Int. Cl.[4] B66F 11/00
U.S. Cl. 414—698 4 Claims

1. In a mobile material handling machine including a material handling element and an operator's control station which provides a line of sight between an operator positioned thereat and the material handling element, the improvement comprising:

a plate having an edge and an upper surface and a lower surface and being pivotally attached to said material handling element in line with the operator's line of sight from said station toward said element, said plate having first indicia means on its edge, second indicia means on its top surface and third indicia means on its bottom surface, said first indicia means being in line with the operator's line of sight when said material handling element is positioned at a predetermined angle relative to said operator's control station, said second or third indicia means being in line

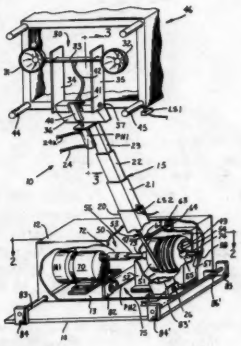


with the operator's line of sight when the material handling element is inclined relative to said predetermined angle in respectively first or second directions.

4,604,026
TELESCOPING PARTS MANIPULATOR

Keith Barrett, Langwarrin, Australia, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Dec. 14, 1983, Ser. No. 561,418
Claims priority, application Australia, Mar. 1, 1983, PF8254
Int. Cl.[4] B25J 11/00
U.S. Cl. 414—728 26 Claims



1. A method for engaging and removing a molded article from a molding machine, comprising the steps of:

detecting the opening of the molding machine and providing a mold opening signal in response to the opening of the mold;

extending a telescoping extensible and retractable arm into the space between the mold halves in response to the mold opening signal;

engaging the molded article in the molding machine with workpiece engaging means carried by the arm;

retracting the arm and the molded article carried by the workpiece engaging means out of the space between the mold halves; and

releasing the molded article at a work station remote from the mold.

17. A workpiece manipultor, comprising:

a base portion,

an extensible arm mounted at one end to said base portion and comprising a plurality of tubular telescoping members extensible and retractable along a longitudinal axis,

cable means housed within said telescoping members having one end attached to the innermost one of said tubular members,

cable drum means for spooling the other end of said cable means,

drum driving means for rotating said drum means in one direction for winding said cable means and in the other direction for unwinding said cable means, said arm extending as said cable means unwinds and retracting as said cable means winds, and

workpiece engaging means mounted to the upper end of said arm for engaging with a workpiece,

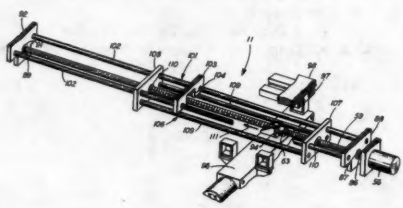
wherein said cable means pushes said innermost one of said tubular members to extend said arm and pulls said innermost one of said tubular members to retract said arm.

4,604,027

MANIPULATOR OF ARTICLES AND METHODS OF MOVING ARTICLES OVER AN EXTENDED DISTANCE

Alan R. Becker, Coopersburg; Richard A. McCorkle, Allentown; Robert A. Miller, Easton, and Gary J. Plessl, Allentown, all of Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 21, 1984, Ser. No. 622,902
Int. Cl.[4] B65G *25/00*
U.S. Cl. 414—749 1 Claim



1. A manipulator comprising:

a manipulator head (16) mounted for movement over a predetermined first distance;

first means (59) for moving the manipulator head along such first distance, such moving means extending longitudinally over at least such first predetermined distance and into engagement with such manipulator head at an intermediate position along such first distance, such engagement dividing the moving means into first and second portions;

means, mounted for movement in the direction of the longitudinal extent of and in supportive engagement with the first and second portions of said first moving means, for supporting said first moving means, said supporting means being capable of shifting the supportive engagement with the first moving means in the direction of a movement of the manipulator head within such first distance to support the longer of the first and second portions of the first moving means in a central position thereof, such that none of the first portions of the first moving means exceeds an undesirably long supported length;

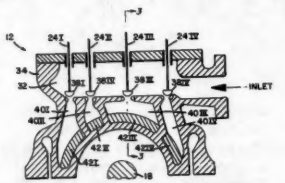
a fixed frame structure including first and second end support brackets (88,92) located at one and the other end of such first distance, respectively, and guide rails (102) mounted to each of the first and second end support brackets and extending there between over said first distance, said guide rails being centrally supported by a fixed center support (103) mounted to said fixed frame structure, and wherein said means for supporting said moving means comprises a frame including two traveling support brackets (107,108), a first one of said traveling support brackets being movably mounted to the guide rails on one side of the center support and the second one being movably mounted to the guide rails on the other side of the center support, each of the traveling support brackets slidably engaging said first moving means to support said first moving means in a plane perpendicular to the longitudinal extent of the moving means, said traveling support brackets being spaced by longitudinal supports (109) of a length such that one of the traveling support brackets becomes located in proximity to the center support when the other of the traveling support brackets is located in proximity to the respective one of the first and second end support brackets.

4,604,028

INDEPENDENTLY ACTUATED CONTROL VALVES FOR STEAM TURBINE

Thomas L. Yeaple, Lynn; James B. Wagner, Peabody, and Donald H. Hall, Middleton, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed May 8, 1985, Ser. No. 731,691
Int. Cl.[4] F01D *17/18*
U.S. Cl. 415—38 1 Claim



1. A turbine system comprising:

a turbine;

a control valve system for feeding a compressible fluid to said turbine including at least first, second and third control valves for independently controlling admission of said compressible fluid to respective first, second and third nozzle groups in said turbine; said first nozzle group having a substantially smaller number of nozzles than either of said second or third nozzle groups; said second nozzle group having a number of nozzles intermediate the number of nozzles in said first and third nozzle groups; and, the sum of the nozzles in the first and second nozzle groups containing at least as many nozzles as said third nozzle group; and,

a control system including means for producing first, second and third independent control signals for respectively positioning said first control valve in a governing position while independently controlling said second and third control valves in fully open or fully closed positions; whereby transfer is made from a first condition in which said second control valve is fully open and said third control valve is fully closed while said first control valve is partly open to a second condition supplying the same amount of said compressible fluid to said turbine in which said first and second control valves are fully closed and said third control valve is fully open to provide improved operating efficiency.

4,604,029

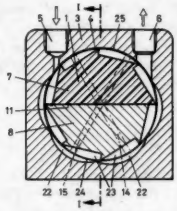
COMPRESSED-AIR VIBRATOR WITH TURBINE DRIVE

Willy Fink, Waltalingen, Switzerland, assignor to Findeva AG, Oerlingen, Switzerland

Filed Mar. 21, 1984, Ser. No. 591,766
Claims priority, application Switzerland, Apr. 20, 1983, 2128/83
Int. Cl.[4] F01D *1/36;* F16H *33/00*
U.S. Cl. 415—92 4 Claims

1. In a compressed-air vibrator with a turbine drive, including an unbalanced cylindrical rotor, a closed housing having a cylindrical chamber, said rotor being rotatably supported within said chamber, an inlet opening in said housing for the inlet of compressed air into said chamber, and a discharge opening in said housing for the exit of air from said chamber; the improvement comprising in that said rotor is constituted of

at least two segments of differing specific weights, at least one said segment being constituted of metal and at least one said segment being constituted of a plastic material, each said segment forming respectfully one-half of said rotor, the rotational axis of said rotor being located to extend along the contact surface between said two segments.



4,604,030

COMPRESSOR WITH VARIABLE INCIDENCE STATOR VANES

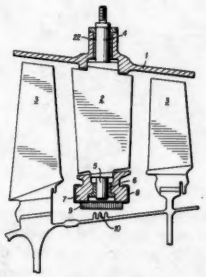
Jacky Naudet, Bondoufle, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.-M.A., Paris, France

Filed Nov. 27, 1984, Ser. No. 675,214

Claims priority, application France, Dec. 7, 1983, 83 19538

Int. Cl.[4] F01D *11/02*; F04D *29/56*

U.S. Cl. 415—126 **8 Claims**



1. A turbo machine comprising:

a casing having annulus means,

a rotor in said casing and having rotor blades in at least one annular array,

a stator in said casing and having vanes of variable incidence in at least one annular array, the vanes being in operative relationship with at least one said array of rotor blades, each said vane having means defining a shoulder at its radially inner end,

bearing means carried by the annulus means and receiving the stator vanes for variation of the angle of incidence thereof, each stator vane including pivot means engaged in the bearing means, the annulus means also including a plurality of sectors,

sealing means intended to limit leakage losses between the stator and the rotor and being mounted to each sector, and

adjustment means for the stator vanes distributed between the sectors,

wherein the bearing means comprise means defining a bush at the location of each adjustment means, each said bush including an external screw thread, and internally screw-threaded seating means receiving the bush in screw-threaded relationship, wherein relative angular motion of each bush relative to the corresponding seating serves in cooperation with the shoulder to adjust the radial location of the corresponding sector, and means for locking the bush in the adjusted radial location on completion of said adjustment.

4,604,031

HOLLOW FLUID COOLED TURBINE BLADES

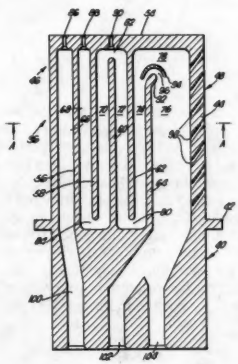
Roger W. Moss; Michael H. Coney, and David A. Richardson, all of Derby, England, assignors to Rolls-Royce Limited, London, England

Filed Aug. 27, 1985, Ser. No. 769,702

Claims priority, application United Kingdom, Oct. 4, 1984, 8425092

Int. Cl.[4] F01D *5/18*

U.S. Cl. 416—97 R **5 Claims**

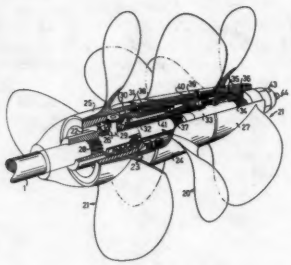


1. A hollow fluid cooled turbine blade comprising a root, a platform and an aerofoil, the aerofoil having at least two longitudinally extending passages for the flow of cooling fluid, at least one turning passage where the cooling fluid is turned from the first longitudinally extending passage into the second longitudinally extending passage, a wall being positioned between and separating the longitudinally extending passages, said wall having an aerodynamically shaped end portion adjacent said turning passage, said aerodynamically shaped end portion of said wall being arranged at an angle with respect to the remainder of said wall to increase the turning radius and said aerodynamically shaped end portion of said wall extending towards a second wall defining an opposing boundary of said first passage, a turning vane having a relatively large turning radius being spaced from said aerodynamically shaped end portion of said wall to define a passage therebetween, said passage between said aerodynamically shaped end portion of said wall and said turning vane converging in the direction of flow from said first longitudinally extending passage to said second longitudinally extending passage, said turning vane extending around said aerodynamically shaped portion of said wall towards said second longitudinally extending passage so as to direct cooling fluid flowing from said first passage into said second passage through said converging passage formed between said aerodynamically shaped end portion of said wall and said turning vane substantially parallel to said wall, said turning vane directing the cooling fluid flowing around said turbine vane substantially parallel to the cooling fluid leaving said converging passage so as to reduce separation of the boundary layer of the cooling fluid from said wall in order to reduce pressure losses in said turning passage.

4,604,032
ROTOR DEVICE

Lennart H. Brandt, Fjärås, and Heinz Pichl, Upsala, both of Sweden, assignors to AB Volvo Penta, Gothenburg, Sweden

Filed Jun. 20, 1984, Ser. No. 622,658
Claims priority, application Sweden, Jun. 22, 1983, 8303593
Int. Cl.[4] B63H *5/10*; B64C *11/48*
U.S. Cl. 416—128 **10 Claims**

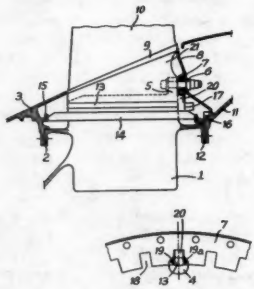


1. In a rotor device having at least three coaxial bladed rotors, a shaft, and a planetary gear system including at least one sun gear carried by said shaft, at least one planet gear meshing with said sun gear and carried by a planet gear carrier, and a gear ring meshing with said planet gear, said rotors having blades to impart a flow to a fluid when rotating or to be rotated by a flowing fluid, the improvement wherein a number of N said rotors are drivingly connected to said gear ring and a number of N+1 said rotors are drivingly connected to said planet gear carrier thereby causing N said rotors to rotate in a direction counter to the rotational direction of said shaft and N+1 said rotors to rotate in the same direction as said shaft.

4,604,033
DEVICE FOR LOCKING A TURBINE BLADE TO A ROTOR DISK

Jean M. Surdi, Melun, France, assignor to S.N.E.C.M.A., Evry, France

Filed Jun. 11, 1985, Ser. No. 743,599
Claims priority, application France, Jun. 14, 1984, 84 09286
Int. Cl.[4] F01D *5/32*
U.S. Cl. 416—220 R **8 Claims**

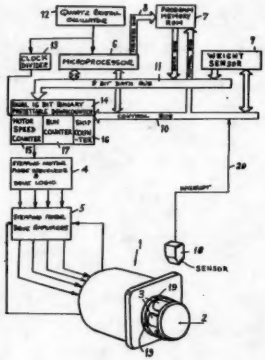


1. A device for locking a turbine blade to a rotor disk rotatable about a central axis comprising:
(a) a plurality of slots defined by the periphery of the rotor disk, each slot having a base and a dovetail shaped cross-section;
(b) a locking ring defining a plurality of inwardly opening notches;
(c) attachment means to removably attach the locking ring to a downstream side of the rotor disk such that each notch is aligned with a slot;
(d) a foot portion on the turbine blade slidably retained in each slot, the foot portion having an axial projection extending downstream of the rotor disk; and
(e) a block inserted between the foot portion of the blade and the base of the slot to move the blade in a radial direction such that the axial projection enters the notch to lock the blade in position on the rotor disk.

4,604,034
PERISTALTIC PUMPS

Peter G. Wheeldon, Guildford, and John Kent, Byeworth, Nr Petworth, both of England, assignors to Peritronic Medical Industries plc, London, England

Filed May 2, 1984, Ser. No. 606,016
Claims priority, application United Kingdom, May 3, 1983, 8312069
Int. Cl.[4] F04B *49/00, 49/10*; A61F *2/54*
U.S. Cl. 417—18 **5 Claims**



1. In a peristaltic pump which is adapted to apply a peristaltic action in a succession of peristaltic cycles to a delivery tube disposed in said pump for pumping a fluid flow through said delivery tube, and which includes rotary means arranged to be driven by stepping motor means, the improvement consisting in control apparatus adapted to reduce the dwell period in each said peristaltic cycle, during which dwell period reduced fluid flow would normally occur, thereby to achieve more uniform flow of said fluid being pumped, said control apparatus comprising:
(a) means for producing electrical timing pulses,
(b) adjustable speed pulse counting means responsive to said timing pulses and connected to provide drive pulses for said stepping motor means in response to counting predetermined trains of said timing pulses,
(c) processing means for controlling said speed pulse counting means, whereby said stepping motor means is operated at a speed which drives said pump at a predetermined pumping rate,
(d) indexing means associated with said rotary means and defining a predetermined position of said rotary means, and
(e) sensing means for detecting said indexing means,
(f) said processing means being responsive to said sensing means detecting said indexing means to adjust said speed pulse counting means to increase the speed of said stepping motor means for a predetermined skip period after which skip period said processing means is adapted to reset said speed pulse counting means to operate said stepping motor means at said speed corresponding to said

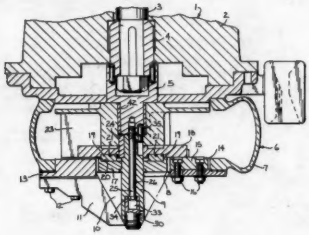
predetermined pumping rate until next detection of said indexing means, whereby said processing means is adapted to regulate said speed pulse counting means alternately to provide drive pulses at repetition rates corresponding to said predetermined pumping rate and said increased skip rate.

4,604,035

SUBMERSIBLE PUMP HAVING FRANGIBLE DRIVE CONNECTION

James R. Roberts, Grayslake, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Jan. 2, 1985, Ser. No. 688,258
Int. Cl.[4] F04B *9/00*; F16D *9/00*; F03B *13/00*
U.S. Cl. 417—319 **8 Claims**



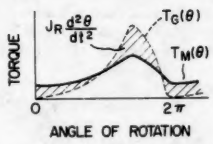
1. In a submersible motor pump unit, a pump casing, an impeller disposed within the casing, a pump shaft connected to the impeller, a motor having a motor shaft, said pump shaft and said motor shaft being disposed in end-to-end relation, shear pin means interconnecting said shafts, one end of said motor shaft having an axial threaded opening, said pump shaft having an axial passage, a bolt slidably disposed in said passage, one end of said bolt having a head and the opposite one end of said bolt projecting outwardly of said passage and being threaded in said axial opening, and means to prevent rotation of said bolt relative to said pump shaft, fracture of said shear pin means and continued rotation of said motor shaft causing said bolt to unthread from said axial opening and moving axially relative to said pump shaft.

4,604,036

TORQUE CONTROL APPARATUS FOR ENCLOSED COMPRESSORS

Masatsune Sutou, Ota, and Yoshihisa Uneyama, Tochigi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1984, Ser. No. 641,675
Claims priority, application Japan, Sep. 9, 1983, 58-146963
Int. Cl.[4] F04B *49/00, 49/06, 49/10*; F25B *1/04*
U.S. Cl. 417—18 **7 Claims**



1. A torque control apparatus for a compressor, the torque control apparatus comprising:

first detecting means for detecting information on a load applied to the compressor;

second detecting means for detecting a rotational position of a rotating portion of the compressor;

first control means for calculating a magnitude of a load torque and a generation time thereof applied to said compressor in dependence upon a first output from said first detecting means and a second output from said second detecting means applied to said first control means;

an AC power source means; and

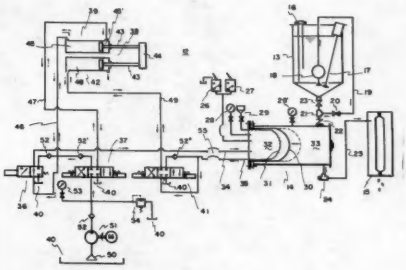
second control means connected between said power source means and said compressor for controlling an output from said power source means applied to a motor for driving said compressor in response to said magnitude of the load torque thereby controlling an output torque of said motor.

4,604,037

SLURRY PUMPING APPARATUS FOR SOLID-LIQUID SEPARATION

Takesi Hoya, 997-8, Oaza Bushi, Iruma-shi, Saitama-ken, Japan

Filed Dec. 17, 1984, Ser. No. 682,333
Claims priority, application Japan, Sep. 21, 1984, 59-196757
Int. Cl.[4] F04B *43/06*
U.S. Cl. 417—394 **7 Claims**



1. In a slurry pumping apparatus including a hydraulic pressure source, and a diaphragm pump, interposed between a solid-liquid separator and a slurry tank, and connected to an oil tank, the diaphragm pump having a hydraulic pressure chamber connected to a supply/discharge pump through changeover valve means, the improvement comprising: said supply/-discharge pump comprising a fluid supply pump and a fluid discharge pump which are mechanically connected together such as to be operable as one unit, said fluid discharge pump having its suction/discharge chamber connected through a suction/discharge passage to a first changeover valve communicating with said oil tank and the hydraulic pressure chamber of said diaphragm pump, said fluid supply pump having a first pressurizing chamber connected to said oil tank through a second changeover valve, and a second pressurizing chamber connected to said oil tank and to the hydraulic pressure chamber of said diaphragm pump.

4,604,038

REMOTELY OPERABLE PERISTALTIC PUMP

Robert R. Belew, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 8, 1985, Ser. No. 709,255
Int. Cl.[4] F04B *43/12*
U.S. Cl. 417—475 **20 Claims**

1. A compact peristaltic pump device having multiple flow channels comprising:

a housing frame having a rear frame member and a front frame member with integral side frame members spaced apart and carried between said rear and front frame members;

a central shaft assembly carried between said side frame members having a central shaft rotatably carried by said side frame members;

a rotating roller assembly rotatably carried by said central shaft assembly;

a plurality of circumferentially spaced rollers carried about said roller assemblies;

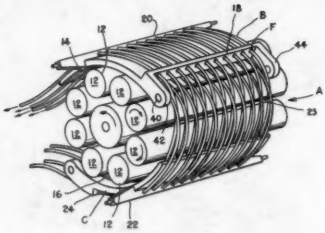
first rotary drive means for rotating said roller assembly about said central shaft;

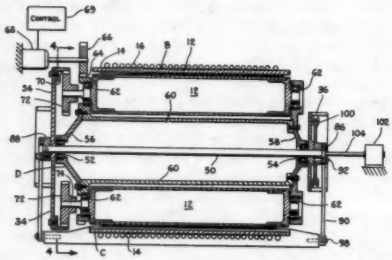
second rotary drive means for rotating each one of said rollers individually on said roller assembly as said roller assembly is driven about said central shaft;

an upper pressure shoe plate carried by said housing frame generally above said roller assembly;

a lower pressure shoe plate moveably carried by said housing frame generally below said roller assembly in diametrically opposing relation to said upper pressure shoe plate;

means for mounting a first number of flexible tubes in a side by side arrangement between said roller assembly and said





upper pressure shoe plate generally along the length of said upper pressure shoe plate to provide multiple parallel flow channels;

means for mounting a second number of flexible tubes between said roller assembly and said lower pressure plate in a side by side arrangement generally along the entire length of said lower pressure shoe plate to provide multiple parallel flow channels;

said mounting means including guide means for interlacing said first and second number of flexible tubes with one another so that said first number of flexible tubes are guided along an outside surface of said lower pressure shoe plate, and said second number of flexible tubes are guided along an outside surface of said upper pressure shoe plate with said first and second number of flexible tubes crossing between each other at said rear frame member of said frame housing.

4,604,039

SCROLL TYPE FLUID COMPRESSOR WITH AXIAL CLEARANCE ADJUSTING CONSTRUCTION

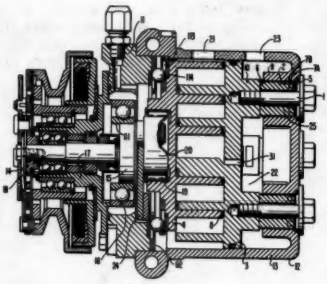
Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Japan

Filed Jul. 30, 1985, Ser. No. 760,640

Claims priority, application Japan, Jul. 31, 1984, 59-158627

Int. Cl.[4] F04C *18/04, 29/00*

U.S. Cl. 418—55 **5 Claims**



1. A scroll type fluid compressor comprising:

a housing;

a fixed scroll fixedly disposed within said housing and having a first circular end plate from which a first wrap extends into the interior of said housing;

an orbiting scroll having a second circular end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to form a plurality of line contacts which define at least one pair of sealed off fluid pockets;

said first end plate having a plurality of first threaded apertures facing said housing to adjustably fix said first end plate to said housing;

said housing having a plurality of second threaded apertures corresponding in number and position to said first apertures;

a sleeve having external screw threads adjustably threaded into each of said second threaded apertures so that the inner end surface of said sleeves presses against said first end plate to adjust the axial clearance between both said scrolls; and

a threaded member passing through said sleeves and threadedly fixed to said first threaded apertures, so that said fixed scroll is adjustably fixed within said housing.

4,604,040

DISPLACEMENT MACHINE HAVING A HOUSING AND PISTON WITH SPIRAL WALLS

Hans Baumgartner, Viersen; Manfred Brandstadter, Dusseldorf, and Rainer Sudbeck, Wassenberg, all of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co., KG, Neuss, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,075

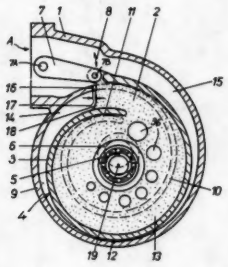
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3407939

Int. Cl.[4] F01C *1/04, 19/00*

U.S. Cl. 418—55 **3 Claims**

1. A displacement machine for a fluid comprising a housing including a spiral wall, a displacement body including a spiral wall engaged with said spiral wall of said housing to form chambers therewith, said spiral wall of said displacement body extending over an angle greater than 360° to provide overlapping first and second ends, said displacement body further including a transverse disc from which said spiral wall extends axially on both sides of said transverse disc, means connected

to said displacement body to rotate the same along a closed circular path, and a crank arm pivotably connected to said housing at a first pivot axis and to said displacement body at a second pivot axis in the region of said spiral wall of said displacement body, said second pivot axis being spaced from the center of rotation of said closed circular path to cause said displacement body to undergo reciprocal movement along an open path at said second pivot axis, said transverse disc having a radial terminal edge extending between said overlapping first and second ends of said spiral wall of said displacement body,



said spiral wall of said housing having a slot in which said disc is received, said spiral wall of said housing having a bounding edge for said slot facing said terminal edge of said disc in spaced relation therewith, said terminal edge of said disc having a shape corresponding to the path of movement of said terminal edge of said disc relative to said bounding edge upon movement of said displacement body so that the distance between said terminal edge of said disc and said bounding edge remains substantially constant at least during one-half of the travel of said displacement body along said closed circular path.

4,604,041

ROTARY VANE PUMP

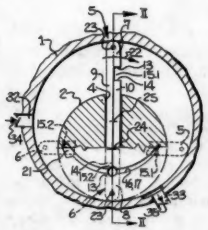
Siegfried Hertell, and Robert Lange, both of Radevormwald, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid, Fed. Rep. of Germany

Filed Apr. 9, 1985, Ser. No. 721,325

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1984, 3413299; Jun. 26, 1984, 3423426

Int. Cl.[4] F04C *18/00, 29/00*

U.S. Cl. 418—82 **16 Claims**



1. A rotary vane pump adapted for use as a vacuum pump in an automobile or the like, and which comprises

a cylindrical housing having a fluid inlet and a fluid outlet,

a cylindrical rotor eccentrically mounted for rotation within said housing, with the rotational axes of the housing and rotor defining a dead center plane and with the surfaces of the housing and rotor being closely adjacent to each other at a bottom dead center position which lies along said dead center plane, said rotor including a slot extending along the axial direction thereof and diametrically therethrough,

a pair of overlying vanes slideably mounted in said slot for radial movement with respect to each other and said slot during rotation of said rotor, each of said vanes having a generally hook-like outline in cross section and comprising a shank portion having a bottom edge at one end thereof and a laterally offset head portion at the other end thereof, with said head portion having a width which is approximately the same as the width of said rotor slot and twice the width of said shank portion, and with said shank portions of said pair of vanes overlying each other within said slot with said head portions at respective opposite ends of said slot and so as to define a hook space between each head portion and the bottom edge of the other vane, and with said rotor and vanes being dimensioned so that each hook space enters the slot during the portion of each rotation of said rotor between about 90° before said bottom dead center position and 90° after said bottom dead center position, and

means for providing a fluid in each hook space during that portion of each rotation of said rotor between said bottom dead center position and the point at which the hook space leaves the slot, and means for pressurizing the fluid provided in each hook space during said portion of each rotation so as to assist in moving the head portion and the associated vane radially outwardly.

4,604,042

APPARATUS FOR PRODUCING ANISOTROPIC MAGNETS

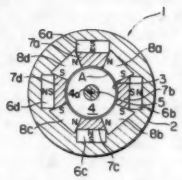
Shigeho Tanigawa; Shuichi Shiina, and Kimio Uchida, all of Kumagaya, Japan, assignors to Hitachi Metals, Inc., Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,183

Claims priority, application Japan, Jun. 8, 1983, 58-102127; Jun. 29, 1983, 58-117857; Jun. 29, 1983, 58-117864; Aug. 11, 1983, 58-147137; Aug. 26, 1983, 58-155975

Int. Cl.[4] B28B *17/00*

U.S. Cl. 425—3 **13 Claims**



1. A mold for producing an anisotropic magnet comprising:

a mold body;

a cavity having a longitudinal axis for molding a composition essentially consisting of magnetic powder and a binder in the presence of an anisotropically oriented magnetic field;

a plurality of first magnet means arranged around said molding cavity circumferentially with respect to said cavity axis for providing magnetic fluxes constituting said magnetic field;

a plurality of yokes each provided between said cavity and each of said first magnetic means for flowing said magnet flux into said cavity; and

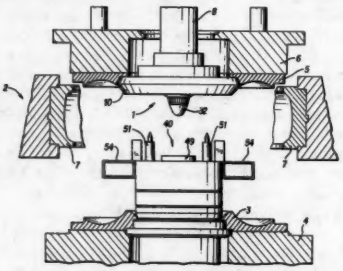
second magnet means provided on both sides of said yokes for preventing the leakage of said magnetic fluxes in the circumferential direction.

4,604,043

EXTRACTOR UNIT FOR TIRE VULCANIZING MOULDS AND DEVICE FOR RAPIDLY DISASSEMBLING IT FROM A VULCANIZING PRESS

Augusto Pizzorno, Milan, and Bruno Salvadori, Cormano, both of Italy, assignors to Pirelli Coordinamento Pneumatici S.p.A., Italy

Filed Oct. 15, 1985, Ser. No. 787,042
Claims priority, application Italy, Nov. 7, 1985, 23481 A/84
Int. Cl.[4] B29H 5/02
U.S. Cl. 425—182 17 Claims



1. A centering extractor unit for pneumatic tire vulcanizing moulds, suitable to be assembled on and operated by a driving mechanism of a press for vulcanizing pneumatic tires, comprising a body having a substantially annular shape to be connected to a mobile shaft of said driving mechanism, and a plurality of laminae radially movable with respect to said body to be led from a first configuration in which they are housed at an interior region of said body to a second configuration in which they radially project from said body, said connection between the extractor unit and said shaft being effected through first connecting means comprising a first set of radial teeth obtained on said shaft and a second set of radial teeth obtained on said body and able to cooperate with said teeth of the first set to block the body with respect to the shaft in consequence of a relative rotation between said elements, characterized by the fact that said body comprises first blocking means, alternatively and freely movable from a non-interference position to an interference position, simultaneously with both said sets of teeth in position of mutual cooperation.

4,604,044

INJECTION BLOW MOLDING APPARATUS

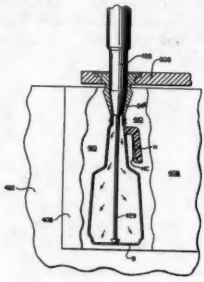
Robert X. Hafele, Baton Rouge, La., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 228,272, Jan. 26, 1981, abandoned, which is a division of Ser. No. 71,301, Aug. 30, 1979, Pat. No. 4,280,805. This application Aug. 17, 1984, Ser. No. 641,794
Int. Cl.[4] B29C 49/06
U.S. Cl. 425—525 2 Claims

1. Apparatus for use in blow molding a bottle, said bottle having a main lower portion, an upwardly extending tapering neck portion at the upper end of said main portion, and an open end at the upper end of said neck portion, said apparatus being useable to blow mold said bottle from a closed lower end perform, said preform having a substantially vertical side wall, an upper end and an integral injection molded handle attached at one point to said side wall, said apparatus comprising:

(a) a vertically split blow mold defining a blow mold cavity having walls defining a main portion, a tapered neck portion, and an open upper end corresponding in shape to the shape of said bottle, said split blow mold further defining a handle cavity communicating with said blow mold cavity at a single point located in said tapered neck portion and below said open upper end of said blow mold cavity,

(b) said blow mold cavity being dimensioned to enclose said preform when the upper end of said preform is supported in the upper end of the blow mold cavity so that the cavity walls defining said tapered neck portion of said blow mold cavity are spaced outwardly from said inclined relative to the preform wall, and said point of attachment of said injection molded handle to said preform is enclosed within said split blow mold, and



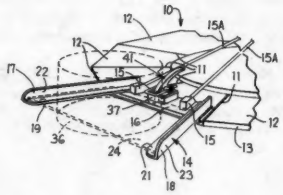
(c) said handle cavity being configured to enclose said integral handle and being dimensioned to allow said integral handle to move outwardly in response to outward movement of said preform side wall into conformity with said tapered neck cavity portion during the blow molding of said preform.

4,604,045

MOLD MOUNTING AND RELEASABLE CLAMP THEREFOR

John W. Black, Hickory Corners, Mich., assignor to Standex International Corporation, Salem, N.H.

Filed Oct. 10, 1984, Ser. No. 659,377
Int. Cl.[4] B29C 45/06
U.S. Cl. 425—575 1 Claim



1. A mold housing support apparatus for supporting a mold housing means, said mold housing means having a mold cavity therein, comprising:

base means;

quick connect and disconnect means for releasably securing said mold housing means to said base means, said quick connect and disconnect means including:

first and second elongate support members secured at one end to said base means and cantilevered horizontally outwardly from said base means, said support members each having a horizontal support surface, and, an upstanding guide wall so that both of said horizontal support surfaces are located between said guide walls, said guide walls further being oriented to diverge in a direction away from said base means at an acute angle;

positive stop means on said base means for limiting the extent to which said mold housing means can move toward said upstanding guide walls;

said mold housing means having a bottom wall, said mold

housing means further having oppositely facing sidewall means thereon converging in a direction toward said base means parallel to said upstanding guide walls when said mold housing means is oriented adjacent said base means and between said upstanding guide walls, said mold housing means being supported on said horizontal support surfaces for movement toward and away from said positive stop means, said mold housing means having inlet means thereon adapted to be aligned with injection nozzle means on an injection molding means when said mold housing means engages said positive stop means;

an upstanding hook means fixedly mounted on said mold housing means or said base means;

toggle lever means fixedly mounted on the other of said mold housing means or said base means, said toggle lever means having an elongate first lever with a handle at one end and being pivotally supported at an opposite end to facilitate movement of said handle between first and second positions about a first axle generally perpendicular to a bisector of said acute angle defined by said diverging guide walls, and a second lever pivotally secured to said first lever for movement about a second axle at a first location thereon intermediate said first axle and said handle, said second lever having gripping means thereon adapted to grip said upstanding hook means at a second location, said first lever, when at said first position, enabling said gripping means to grip said upstanding hook means, and when approaching said second position causing a straight line extending through said first and second axles to be first oriented on one side of said first axle and effect a movement of said mold means toward said base means and a limiting engagement of said mold housing with said positive stop means to effect an alignment of said inlet means with said injection nozzle means upon a continued movement of said second lever until said straight line intersects said first axle thereby bringing said sidewall means into tighter engagement with said positive stop means so that further movement of said first lever will cause a yieldable tensioning of said second lever until said straight line passes to the opposite side of said first axle whereat said first lever will be held in said second position by the tension on said second lever.

4,604,046

DIRECT IGNITION GAS BURNER CONTROL SYSTEM

Carl J. Mueller, 7063 Stinger Pl., St. Louis, Mo. 63129; Bernard T. Brown, 4601 Skyridge Dr., St. Louis, Mo. 63128; Dennis M. Rippelmeyer, 217 Koenigsmark, Waterloo, Ill. 62298, and John S. Haefner, P.O. Box 221, Hillsboro, Mo. 63050

Division of Ser. No. 296,818, Aug. 27, 1981, Pat. No. 4,444,551. This application Jan. 16, 1984, Ser. No. 571,336

Int. Cl.[4] F23N *5/00*

U.S. Cl. 431—2 **4 Claims**

1. An improved method for operating a direct ignition gas burner control system which includes a burner, two electrically operated valves connected fluidically in series with the burner, an electrical resistance igniter, and a microcomputer, comprising the steps of:

energizing the igniter;

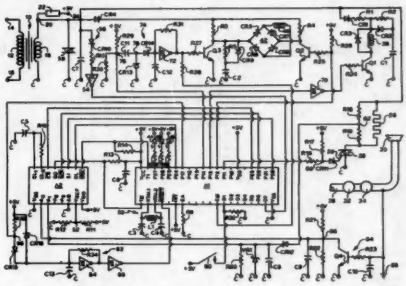
opening both valves so as to enable flow of gas to said burner and ignition thereof;

detecting burner flame and continuing said flow of gas to said burner as long as said burner flame exists;

closing one of said valves;

determining if said burner flame still exists and providing an indication of valve leakage if said burner flame still exists;

closing the other of said valves; and



reversing order of closing said valves on alternate burner cycles.

4,604,047

FLARE FOR AND METHOD OF FLARING HIGH VELOCITY GAS

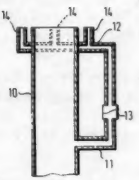
Leslie M. F. Coulthard, Sutton Coldfield, England, assignor to GKN Birweico Limited, Halesowen, England

Filed Mar. 15, 1984, Ser. No. 589,735

Claims priority, application United Kingdom, Mar. 19, 1983, 8307687

Int. Cl.[4] F23D *14/58*

U.S. Cl. 431—5 **12 Claims**



1. In a method of flaring flammable gas supplied at high pressure from a supply and released at high velocity from a tip of an open pipe flare, wherein a quantity of gas at lower pressure and lower velocity than said supply is burnt at or adjacent the tip of said flare in one or more further outlets adapted to produce flares of sufficient size and energy to establish continuous ignition of the high velocity gas up to a considerable distance above the tip, the steps of:

deriving a quantity of gas from said supply upstream of the tip of the flare;

expanding the derived quantity of gas to a pressure lower than said high pressure;

utilizing said expanded derived gas to provide at least a part of said lower pressure, lower velocity gas; and

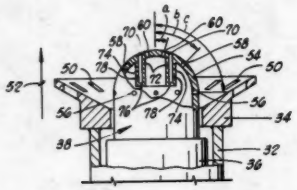
mixing at least a part of said withdrawn gas with at least part of a stream of low pressure flammable gas, from a source independent of the high pressure supply, to provide at least part of said lower pressure, lower velocity gas.

4,604,048

METHODS AND APPARATUS FOR BURNING FUEL WITH LOW NO_x FORMATION

Robert E. Schwartz, and Roger K. Noble, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed May 6, 1985, Ser. No. 731,080
Int. Cl.[4] F23C 5/00
U.S. Cl. 431—8 **12 Claims**



1. In a burner apparatus for combusting a fuel-air mixture wherein fuel is discharged from at least one nozzle disposed within a chamber, air is caused to flow into the chamber whereby it mixes with the fuel and the resulting fuel-air mixture is ignited and combusted, the improvement whereby the formation of nitrogen oxides is inhibited comprising:

said nozzle having one or more ignition orifices disposed therein positioned to discharge a first portion of said fuel therethrough whereby said fuel mixes with air and provides an ignition zone adjacent said nozzle;

one or more primary combustion orifices disposed in said nozzle positioned to discharge a second portion of said fuel therethrough whereby said fuel is distributed in a turbulent pattern which causes said fuel to mix with a rate of air in excess of that required for the stoichiometric burning thereof and to burn in a primary combustion zone; and

one or more secondary combustion orifices surrounded by a fuel discharge recess, the secondary orifices and recess being disposed in said nozzle interiorly of said primary combustion orifices and positioned to discharge the remaining portion of said fuel therethrough in the form of high velocity jets of fuel shielded by slower moving fuel whereby said fuel is distributed within and downstream of said primary combustion zone, is mixed with air from said primary combustion zone diluted with combustion products and is burned in a secondary combustion zone substantially isolated from direct contact with incoming air by said primary combustion zone.

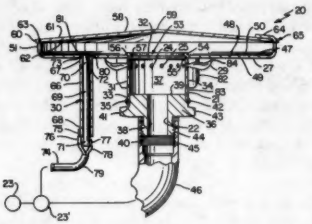
4,604,049

DUAL RATE BURNER CONSTRUCTION AND METHOD OF MAKING THE SAME

Jay R. Katchka, Cypress, and Gilbert Schultz, Long Beach, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 26, 1985, Ser. No. 769,572
Int. Cl.[4] F23H 5/10
U.S. Cl. 431—80 **20 Claims**

1. In a dual rate burner construction comprising a burner housing means having inlet means for receiving fuel from a source thereof and outlet means through which said fuel can issue to produce flame means exterior to said burner housing means when said issued fuel has been ignited, a flame spreader means carried by said burner housing means for spreading said flame means into a desired heating pattern thereof for a heating purpose when said fuel is being directed into said inlet means at a full rate of flow thereof and for directing said flame means into a desired standby pattern thereof when said fuel is being directed into said inlet means at a standby rate of flow thereof, and a flame sensing means carried by said construction for detecting the presence of said flame means, the improvement wherein said flame sensing means is carried by said flame



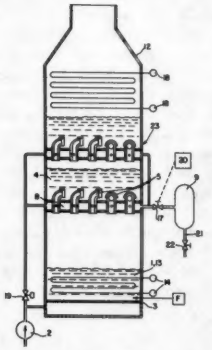
spreader means in a spaced relation to said burner housing means.

4,604,050

METHOD OF CLEANING NOZZLES IN A FLUIDIZED BED

Erik A. Henriksson, Linköping, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Feb. 28, 1984, Ser. No. 584,511
Claims priority, application Sweden, Mar. 2, 1983, 8301148
Int. Cl.[4] B01J 8/28
U.S. Cl. 431—121 **6 Claims**



1. In a fluidized bed heating plant which comprises a first chamber means containing a first bed, said first chamber means including a floor defined by upper and lower spaced apart bottom plates which provide a plenum space therebetween; a second chamber means containing a second bed, said second chamber means being in communication with said lower bottom plate; and a plurality of combustion gas passage means extending between said upper and lower bottom plates and communicating said second chamber means with said first chamber means, each of said plurality of combustion gas passage means including at least one hole communicating with said plenum space, the improvement wherein said fluidizing bed heating plant includes supply means for supplying a continuous flow of air to said plenum space so that said air will continuously flow into each of said plurality of combustion gas passage means through said at least one hole and mix with the combustion gas flowing therethrough into said first chamber means, tank means containing a pressurized gas, a fluid line connecting said tank means with said plenum space and a valve in said fluid line, the intermittent opening of said valve causing said pressurized gas to flow into said plenum space and into each of said plurality of combustion gas passage means to generate a pressure-energy shock wave in the combustion gas flowing therethrough, thus causing any impurity particles

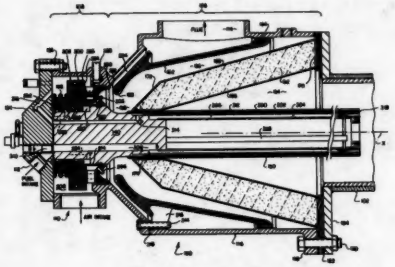
lodged in each of said plurality of combustion gas passage means to become dislodged and conveyed into said first chamber means, and a control means connected to said valve to automatically control the opening and closing of said valve.

4,604,051

REGENERATIVE BURNER

Theodore E. Davies, Hudson; Dennis E. Quinn, Brunswick, both of Ohio, and James E. Watson, Southgate, Mich., assignors to Gas Research Institute, Chicago, Ill.

Filed Aug. 16, 1984, Ser. No. 641,331
Int. Cl.[4] F23D *11/44*
U.S. Cl. 431—166 **42 Claims**



1. A regenerative burner operable in fire and flue modes comprising:

a burner shell having first and second internal chambers, said first chamber being disposed on the flame axis of said burner and said second chamber surrounding the radial perimeter of said first chamber;

a gas permeable annular regenerative bed separating said first and second chambers such that gas flow between said first and second chambers must travel through said regenerative bed in a generally radial direction with respect to said flame axis;

means for supplying combustion air to said second chamber when said burner is in said fire mode and for exhausting products of combustion from said second chamber when said burner is in said flue mode; and

means for supplying fuel in the vicinity of said flame axis for mixing with combustion air to support combustion when said burner is in said fire mode.

4,604,052

DUAL-WATER MIXTURE FUEL BURNER

Thomas D. Brown, Finleyville; Douglas P. Reehl, Pittsburgh, and Gary F. Walbert, Library, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

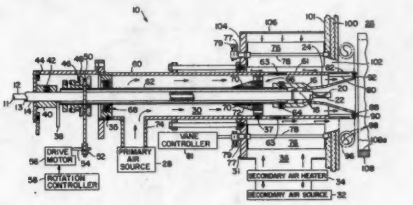
Filed Apr. 29, 1985, Ser. No. 728,358
Int. Cl.[4] F23D *11/04*
U.S. Cl. 431—168 **19 Claims**

1. A coal-water mixture fuel burner coupled to a combustion chamber comprising:

a rotating cup having a first open narrow end, a second open expanded end and a tapered inner portion positioned therebetween, wherein the second expanded end of said rotating cup is positioned adjacent to and in communication with an aperture in the combustion chamber;

first inner conduit means connected to a coal-water mixture fuel source and having a first end positioned within the first open narrow end of said rotating cup for directing said coal-water mixture fuel within said rotating cup; and

second outer conduit means connected to a source of steam and coaxially positioned about said first inner conduit means along a portion of the length thereof and including a first end positioned within the first open narrow end of said rotating cup and along the length of said first inner conduit means for directing said steam flow onto the tapered inner portion of said rotating cup for facilitating



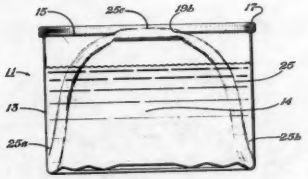
the flow of the coal-water mixture fuel along said rotating cup and its discharge in a collection of fine particles therefrom into the combustion chamber.

4,604,053

FOOD WARMING CARTRIDGE

Rudolpho de la Rosa, 2639 Tanglewood, Grapevine, Tex. 76051

Filed Mar. 25, 1985, Ser. No. 715,678
Int. Cl.[4] F23D *3/24*
U.S. Cl. 431—320 **8 Claims**



1. A food warming cartridge with liquid fuel, comprising in combination:

a liquid fuel container having a lid with a generally rectangularly shaped aperture therein;

a generally rectangularly shaped wick having at least one end submersed in the fuel, a central section of the wick in contact with a lower side of the lid and which blocks the aperture; and retainer means for retaining the wick in contact with the lower side of the lid and holding the central section in a generally flat position parallel with the plane of the lid whereby a side of the central section is exposed so that an exposed side has the shape of the aperture.

4,604,054

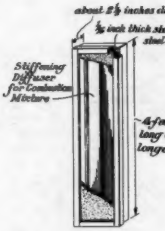
RADIANT HEATING

Thomas M. Smith, 1415 Golf Rd., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 435,412, Oct. 20, 1982, abandoned, and a continuation-in-part of Ser. No. 567,270, Dec. 30, 1983, abandoned, and a continuation-in-part of Ser. No. 628,989, Jul. 9, 1984, and a continuation-in-part of Ser. No. 592,793, Mar. 23, 1984. This application Jul. 8, 1985, Ser. No. 752,908
Int. Cl.[4] F23D *13/12*
U.S. Cl. 431—328 **4 Claims**

1. A gas-fired burner having a ceramic fiber mat held across the mouth of a rectangular elongated sheet metal burner body at least twice as long as it is wide and at least two feet long, to leave a shallow combustion mixture plenum about three-eighths to about one inch deep and having side walls between the mat and the back wall of the body, a rigidifying partition extending across essentially the entire plenum and welded at

essentially all of its periphery to the interior of the plenum walls to divide the plenum into front and back compartments, and a combustion mixture inlet connected to the back compartment, the partition having spaced openings for passing combustion mixture from the back compartment to the front compartment.

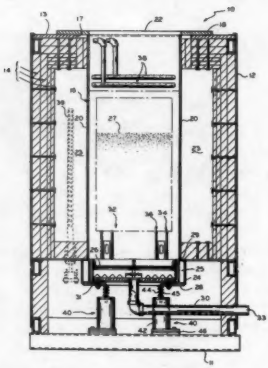

about 1½ inches deep
⅛ inch thick stainless steel sheet
Stiffening Diffuser for Combustion Mixture
4 feet long or longer

4,604,055

LIP-HUNG RETORT FURNACE

Peter B. Mackenzie, Fonthill, Canada, assignor to Can-Eng Holdings, Ltd., Canada

Filed Jun. 3, 1985, Ser. No. 740,749
Int. Cl.⁴ C21D *9/00*
U.S. Cl. 432—58 **8 Claims**



1. A fluidized bed furnace comprising:

a furnace housing including an outer shell;

a furnace base and an outer top plate secured to the respective lower and upper ends of said furnace housing;

a vertical retort having an opened upper end and an opened lower end, said retort being disposed in an opening formed in said outer top plate and extending downwardly into the center of said furnace housing;

heat insulating material disposed between said outer shell and said vertical retort;

a retort base assembly being adapted for closing the lower end of said vertical retort;

upper support means for supporting the upper end of said vertical retort on top of said outer top plate so as to permit downward growth only during thermal expansion;

said upper support means including an annular flange formed integrally with the sidewalls of said retort at the upper end thereof and being adapted to be fixedly mounted to the outer surface of the outer top plate;

lower support means interposed between the lower surface of said retort base assembly and the upper surface of said furnace base for supporting substantially all the weight of said retort, the weight of the load of a fluidizable media, and the weight of a load of material to be heat treated; and

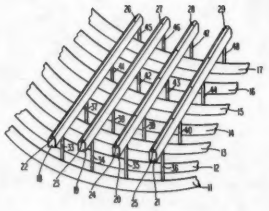
said lower support means including at least one resilient support device consisting of a block member, a coiled spring, a guide rod, and lower shims, wherein on end of said block member is adapted to receive one end of said guide rod, the other end of said guide rid being attached to said retort base assembly, said lower shims being in contacting engagement with the other end of said block member for bearing against the upper surface of sand furnace base, said coiled spring being disposed in surrounding relationship with said guide rod, the ends of said coiled spring being in contacting engagement for bearing against the lower surface of said retort base assembly and the upper surface of said block member respectively.

4,604,056

VACUUM FURNACE SYSTEM HEARTH

William R. Jones, 3 Hillcraft Way, Telford, Pa. 18964

Filed Mar. 1, 1985, Ser. No. 707,217
Int. Cl.⁴ F23D *23/00*; F27B *9/14*
U.S. Cl. 432—249 **4 Claims**



1. A hearth arrangement to be used in a hot zone of a vacuum furnace, which vacuum furnace has an opening to pass work pieces therethrough and which hot zone has heat generating means therein, comprising in combination: a plurality of support bars formed of material which has good tensile strength at high temperatures and low thermal expansion, each of said support bars formed to have an upper surface and a lower surface and each having a depth dimension therebetween, each of said support bars further formed to have a longitudinal groove along its upper surface; a plurality of molybdenum bar support rods, with a different group thereof respectively secured to the lower surface of a different associated one of said support bars, said molybdenum bar support rods formed to hold its associated support bar free of coming in contact with said heating generating means; and a plurality of load support rods formed of molybdenum and coated with titanium nitride and each of said support rods formed to rotatably fit into said groove of an associated support bar.

4,604,057

CAST ORTHODONTIC APPLIANCE

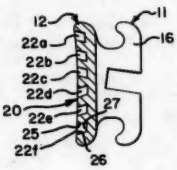
John E. Viglietti, Sheboygan, Wis., assignor to American Orthodontics Corporation, Sheboygan, Wis.

Filed Jul. 3, 1985, Ser. No. 751,903
Int. Cl.⁴ A61C *7/00*
U.S. Cl. 433—9 **7 Claims**

1. In a cast orthodontic appliance adapted to be bonded to a tooth with a bonding material including a pad portion having a bonding surface and an appliance portion extending from the pad portion, said bonding surface being curved to conform to a tooth surface receiving a bonding material to bond the appliance to a tooth,

the improvement being in the bonding surface which includes a plurality of lingually opening parallel grooves, said grooves having substantially parallel opposed side

walls, the axes of the grooves as defined by said side walls on opposite sides of the midline of the appliance diverging



outwardly from each other, whereby a greater tooth surface bonding area is provided to interconnect the bracket and tooth through the bonding material.

4,604,058

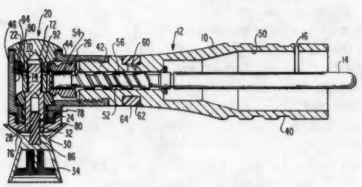
DENTAL APPLIANCE

Leo Fisher, Denver, and Atilla Weiser, Westminister, both of Colo., assignors to Teledyne Industries, Inc., Denver, Colo.

Division of Ser. No. 438,048, Nov. 1, 1982, Pat. No. 4,486,175. This application Sep. 14, 1984, Ser. No. 650,424

Int. Cl.[4] A61C *1/14*

U.S. Cl. 433—127 **3 Claims**



1. A dental appliance comprising:

an elongated hollow tube;

an elongated drive shaft supported within said tube for axial rotation;

means for coupling one end of said tube to a handle and for coupling one end of said shaft to a source of rotary power;

a head joined to the other end of said tube and defining an interior cavity;

a hub mounted in said cavity for rotation about an axis disposed at an angle with respect to said shaft;

motion translating means disposed in connection with said cavity for transmitting rotary force from said shaft to said hub;

an opening defined in said head and leading outwardly from said cavity, a portion of said hub being accessible through said opening;

means effectively defined in said hub for securing a dental attachment thereto in a location beyond said opening from said cavity;

means for creating a seal between said opening and said hub in order to prevent fluid flow therethrough,

a threaded segment included in said securing means;

and means defining at least a pair of respectively-different thread patterns in said segment.

4,604,059

DENTAL COMPOSITIONS, FIRED DENTAL PORCELAINS AND PROCESSES FOR MAKING AND USING SAME

Irving Klaus, Santurce; Warren Herbstman, Isla Verde, and Jairo Lopez, La Riviera, all of P.R., assignors to Excelco International, Inc., Santurce, P.R.

Filed Jan. 4, 1985, Ser. No. 688,746

Int. Cl.[4] A61C *5/00*

U.S. Cl. 433—217.1 **20 Claims**

1. A process for making a fired, etched dental porcelain for bonding to a dental substrate, said process comprising the steps of providing a dental porcelain composition comprised of a powder dental porcelain frit material and a second material which is selectively chemically etchable from a fired dental porcelain prepared from the composition and which, upon firing of the composition, maintains a separate phase with respect to said powder dental porcelain frit material; forming said dental porcelain composition into a predetermined shape having a dental porcelain surface for attachment to a dental substrate; firing the dental porcelain composition in the predetermined shape so that the second material in the composition is maintained in the fired dental porcelain as said separate phase; and chemically etching said dental porcelain surface with a chemical etching material which selectively removes said second material from said dental porcelain surface to increase the porosity of such dental porcelain surface so as to provide enhanced bonding of said dental porcelain surface to a dental substrate.

11. A process for tooth repair comprising the steps of providing a fired dental porcelain comprising a fired composition including a powder dental porcelain frit material and a second material which is selectively chemically etchable from said fired dental porcelain and which maintains a separate phase with respect to said powder dental porcelain frit material upon such firing, wherein said fired dental porcelain has a dental porcelain surface shaped to be bonded to a surface of a tooth to be repaired and said dental porcelain surface is chemically etched with a chemical etching material to remove second material therefrom to increase the porosity of said dental porcelain surface and thereby provide enhanced bonding of said dental porcelain surface to such a surface of a tooth; and bonding said etched dental porcelain surface of the fired dental porcelain to a surface of a tooth to be repaired.

4,604,060

DENTAL POST SYSTEM

Bernard Weissman, New York, N.Y., assignor to Ipco Corporation, White Plains, N.Y.

Filed May 14, 1985, Ser. No. 733,958

Int. Cl.[4] A61C *5/08*

U.S. Cl. 433—221 **42 Claims**

1. A dental post system for use in preparing a dental restoration, comprising:

a dental core;

an elongated cylindrical post having a lower anchoring portion for secured retention within a cement prepared bore in a tooth stub, and an upper end portion for projecting from the tooth stub to be received within an aperture in said dental core, the restoration being disposed on said dental core;

interlock means for securing said dental core onto said upper end portion of said cylindrical post to prevent both axial lift-off as well as rotational displacement between said dental core and said cylindrical post; and

a laterally extending shoulder portion being provided on said cylindrical post between said lower anchoring portion and said upper end portion to define stop means for engaging said dental core to prevent insertion of said lower anchoring portion into said aperture of said dental

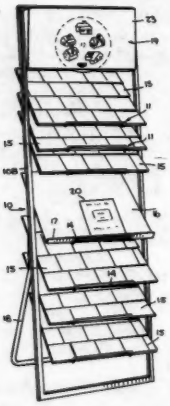
core so that said dentral core is positioned on said upper end portion at a predetermined location to permit coaction between said interlock means and said upper end portion.

4,604,061

DISPLAY RACK AND COLOR SELECTION ASSEMBLY

Reginald Willcocks, 1 Joel Place, Port Washington, N.Y. 11050, and Marvin Zaro, 405 E. 63rd St., New York, N.Y. 10021

Filed Apr. 4, 1985, Ser. No. 719,826
Int. Cl.[4] G09B *25/04*
U.S. Cl. 434—74 **9 Claims**



1. A display rack and color selector assembly comprising:

A. a rack having shelves on which are supported removable sample boards carrying roof shingles in different colors; and

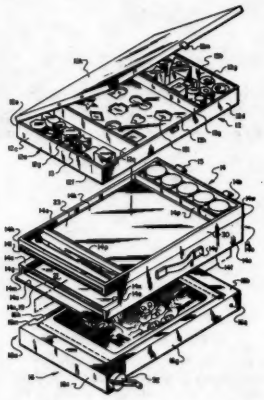
B. a color selector including a front panel on whose face is a radial array of typical homes in different architectural styles, the roof in each picture being notched out to define a window whose geometry matches that of the roof, and a rotatable color wheel mounted behind the panel, the wheel being divided into segments, each having a shingled surface whose color corresponds to that of a respective sample, whereby a homeowner by inspecting a pictured home whose style is similar to that of his own, can then turn the color wheel to bring into registration with the roof window thereof, the segments of the wheel and thereby see how the pictured home looks when its roof is covered with shingles in any one of the different sample colors.

4,604,062

DRAWING/TRACING/TEMPLATE APPARATUS

Margaret H. Woods, 811 Loma Vista Pl., Santa Paula, Calif. 93060

Filed Jul. 29, 1985, Ser. No. 759,895
Int. Cl.[4] G09B *11/04*
U.S. Cl. 434—88 **12 Claims**



1. A drawing/tracing/template apparatus comprising:

A. a template/block assembly further comprising:

(a) a first rigid rectangular structure having a template compartment,

(b) a removable master template having a plurality of cutouts and sized to fit into said template compartment,

(c) a plurality of blocks sized to fit into said cutouts in said master template,

B. a drawing/tracing assembly further comprising a second rigid rectangular structure having outside perimeter dimensions that allows said first rigid rectangular structure to be stacked and be locked in place, by a locking means, to the top of said second rigid rectangular structure, with said second rigid rectangular structure having:

(a) a shallow drawing/tracing area covered on top with a first transparent panel,

(b) a combination left side panel/entry section further having:

(1) a master drawing slot into which is inserted an art master that can be viewed through said first transparent panel,

(2) a light panel/paper roller entry and exit port,

C. a light panel/paper roller assembly further comprising a third rigid rectangular structure having outside perimeter dimensions that allows it to be inserted into and extracted from the light panel/paper roller entry and exit port on said combination left side panel/entry section with said third rigid rectangular structure having:

(a) a light compartment covered on top with a translucent panel,

(b) a set of lights internally located within said light compartment,

(c) a left compartment housing a left paper roll spool that is rotatably attached,

(d) a right compartment housing a right paper roll spool that is rotatably attached,

(e) a paper roll incorporating a set of art masters where one end of roll is attached to said left paper roll spool and other end of paper is pulled over the top of said

translucent panel and attached to said right paper roll spool, and

(f) means to simultaneously rotate said paper roll spools to control the position of the art master being viewed over said translucent panel.

4,604,063

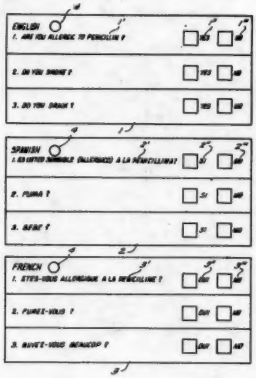
SYSTEM FOR AND A METHOD OF TRANSLATION

Simon Gurmarnik, 650 Mix Ave., Hamden, Conn. 06514

Filed Oct. 29, 1984, Ser. No. 666,097

Int. Cl.[4] G09B *19/08*

U.S. Cl. 434—157 **12 Claims**



1. A system for translation between a plurality of languages, comprising a plurality of carriers each corresponding to one language and including a plurality of questions and a plurality of answer choices to said questions; and transfer means interposable between said carriers, said questions on each of said carriers being located at the same questions locations, and said answer choices on each of said carriers being located at the same answer choices locations, so that when at least two carriers corresponding to two languages are overlaid with one another, similar questions are overlaid in both carriers and similar answer choices are overlaid in both carriers, so that when one person gave an answer to a question on one of said two carriers and therefore in one of said two languages, said given answer is transferred by said transfer means to said underlying carrier, whereby another person identifies the answer and the question on the other of said two carriers in the other of said languages, since said answer choices and said questions are located at the same questions locations and answer choices locations on said other carrier.

4,604,064

PORTABLE DEMONSTRATOR FOR ELECTRONIC EQUIPMENT

Douglas A. Boehm, Hoffman Estates, and David M. Ylinen, Lake Zurich, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 22, 1984, Ser. No. 612,939

Int. Cl.[4] G09B *5/06*

U.S. Cl. 434—224 **15 Claims**

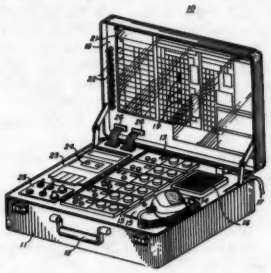
1. A portable hand-carried audio-visual demonstration apparatus for simulating the operation of particularized radio communications equipment, said demonstration apparatus comprising in combination:

means for controlling at least one representative portion of said radio communications equipment to be demonstrated;

visual display means, coupled to said communications equipment control means, and including selected indicators for displaying the simulated operation of said communications equipment in response to the manipulation of said control means;

portable housing means for containing said communications equipment control means with said display means; and

audio reproduction means for providing pre-recorded voice



instruction in the simulated operation of said communications equipment,

whereby said voice instruction directs operator manipulation of said control means which, in turn, effects a corresponding operational and visual response in said display means.

4,604,065

TEACHING OR AMUSEMENT APPARATUS

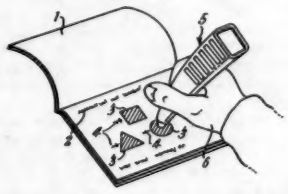
Stephen O. Frazer, and Martin P. Riddiford, both of London, England, assignors to Price/Stern/Sloan Publishers, Inc., Los Angeles, Calif.

Continuation of Ser. No. 478,680, Mar. 25, 1983. This application Jan. 23, 1985, Ser. No. 697,973

Claims priority, application United Kingdom, Oct. 25, 1982, 8230363

Int. Cl.[4] G09B *7/06*

U.S. Cl. 434—331 **26 Claims**



1. Apparatus for use in amusement, manual coordination, teaching, educational evaluation and related purposes, said apparatus comprising a substrate for use in conjunction with a manually manipulatable infra-red emitting and infra-red reflectance measuring device; said substrate comprising:

a sheet of material having determined transparency and reflectivity to infra-red illumination and having opposed major planar surfaces;

printed matter in any desired organization applied to at least one of said major planar surfaces of said substrate in printings of infra-red transparent inks in selected screen densities to provide coloring on said surface of desired color, hue and intensity;

selected portions of said printed matter including at least one printing of infra-red transparent ink and an additional printing in a carbon black infra-red absorptive ink in a sufficiently small screen of dots to minimize visually observed discoloration and graying of said infra-red transparent ink, and to minimize visual detection of the pres-

ence of said carbon black ink dots, but, sufficient to cause a detectable drop in infra-red reflectance at said selected portions when said selected portions are illuminated with infra-red light; and,

other portions of said printed matter including screens of said printing of blue, red, and yellow infra-red transparent inks in blue, red and yellow ink combinations simulating the visually observed discoloration and graying of said selected portions caused by the presence of said carbon black ink dots in said selected portions, and, to simulate dots of infra-red transparent non-carbon black ink substantially matching said dots of infra-red absorptive carbon black ink in visually observed discoloration and light absorptance characteristics, whereby;

casual visual inspection of said substrate will fail to reveal differences in the composition of the inks used in the printing of the respective selected portions and said other portions, but, scanning of said printed substrate with said infra-red emitting and reflectance measuring device will enable differentiation by said device between said selected portions and said other portions.

4,604,066

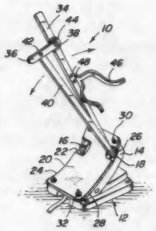
HAND CONTROL FOR FOOT CONTROL TROLLING MOTOR

Christian R. Davatz, 900 E 8th St., Cherryvale, Kans. 67335

Filed Sep. 9, 1985, Ser. No. 774,132

Int. Cl.[4] B60L *15/20*

U.S. Cl. 440—7 **4 Claims**



1. A hand control for a foot control of a trolling motor on a boat, said foot control of the type having a steering pedal, a three speed control knob and an on-off motor switch, said hand control comprising:

(a) a base shoe having a cut out area on one side for said three speed control knob and a guide member on opposite side, said base shoe removably mounted to said steering pedal;

(b) an elongated stationary rod affixed to and extending upwardly from said base shoe so as to manually operate by hand said steering pedal;

(c) an arm pivotally mounted to upper portion of said stationary rod and extending outwardly from said stationary rod; and

(d) an elongated movable rod pivotally mounted to said arm and extending downwardly through said guide member to contact said on-off motor switch so that when said arm is activated by said hand movable rod will operate said on-off motor switch.

4,604,067

METHOD AND APPARATUS FOR CONVERTING LINE TRIMMER INTO A TROLLING MOTOR

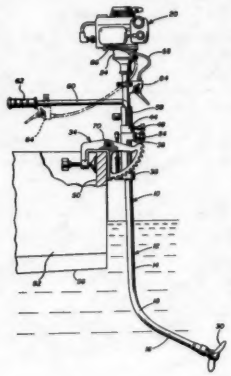
Jimmy C. Roberts, P.O. Box 285, Sumterville, Fla. 33585

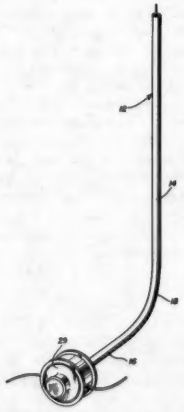
Filed Nov. 20, 1984, Ser. No. 673,773

Int. Cl.[4] B63H *21/26*

U.S. Cl. 440—49 **6 Claims**

1. The method of converting a line trimmer into an outboard trolling motor and wherein the trimmer includes and elongated tubular housing having relatively angulated opposite end portions joined by the smoothly curved intermediate length portion, and elongated flexible drive shaft extending through and journalled from said housing, a drive motor mounted on one end portion of said housing including rotary output shaft drivingly coupled to the corresponding end of said drive shaft, a handle mounted on said one end portion and spaced from said drive motor, and a trimmer line spool head removably threadingly mounted on the other end of said drive shaft remote from said motor, said method including the steps of unthreading said





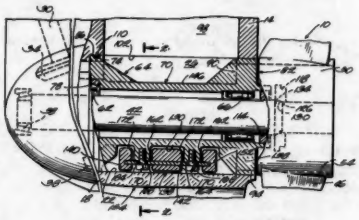
head from the last mentioned end of said drive shaft, threadingly mounting a marine screw-type propeller on said last mentioned end in lieu of said head, removing said handle from said one end portion, providing a boat supportable mount for said one end portion of said housing and rotatably mounting said housing one end portion from said mount, with said housing one end portion disposed in upstanding position, for angular displacement relative to said mount about an axis at least closely paralleling the center axis of said housing one end portion.

4,604,068

MARINE PROPULSION DEVICE LOWER UNIT INCLUDING PROPELLER BEARING MEMBER ANODE

Douglas B. Guinn, Shorewood, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 10, 1984, Ser. No. 648,575
Int. Cl.[4] B63H *1/00*
U.S. Cl. 440—76 11 Claims



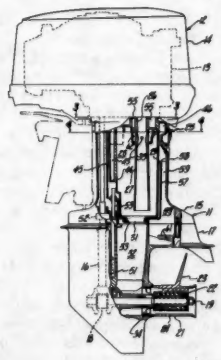
1. A lower unit for a marine propulsion device, which lower unit comprises a lower portion, an open area inside said lower portion, an opening located in said lower portion and communicating said open area with the environment outside of said lower portion, a sacrificial anode passable through said opening, and means operably accessible from outside of said lower portion for releasably securing said sacrificial anode in said open area after the passage of said sacrificial anode through said opening.

4,604,069

EXHAUST SILENCER STRUCTURE FOR OUTBOARD ENGINES

Michihiro Taguchi, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Jul. 24, 1984, Ser. No. 633,792
Claims priority, application Japan, Jul. 28, 1983, 58-136829
Int. Cl.[4] B63H *21/38*
U.S. Cl. 440—88 15 Claims



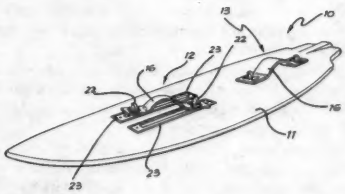
1. In an exhaust system for an outboard motor or the like having a drive shaft housing and a lower unit adapted to be at least partially submerged in the water, an internal combustion engine having a coolant jacket and an exhaust gas outlet, a high speed exhaust gas discharge normally positioned below the water level, a slow speed exhaust gas discharge normally positioned above the water level, a high speed exhaust system for delivering exhaust gases from said engine exhaust gas outlet to said high speed exhaust gas discharge, including a main expansion chamber formed at least in part in said drive shaft housing and an exhaust pipe extending from said exhaust gas outlet and opening into said main expansion chamber, and a slow speed exhaust system for delivering exhaust gases from said engine exhaust gas outlet to said slow speed exhaust gas discharge and including a water chamber formed in said drive shaft housing through which exhaust gases must pass from said exhaust gas outlet to said slow speed exhaust gas discharge, means for supplying coolant from said engine coolant jacket to said water chamber, the improvement comprising said slow speed exhaust system including a plurality of expansion chambers separate from said main expansion chamber and through which exhaust gases pass from said engine exhaust gas outlet to said slow speed gas discharge and means for delivering coolant from said engine coolant jacket to said slow speed exhaust gas discharge for cooling the exhaust gases delivered to the atmosphere from said slow speed exhaust gas discharge.

4,604,070

SKI BOARD HAVING ANGULARLY ADJUSTABLE BINDING

Bruce C. McKee, and Mitchell S. Ross, both of 65 Bungan Head Road, Newport, New South Wales 2106, Australia

Continuation of Ser. No. 573,953, Jan. 25, 1984, abandoned. This application Dec. 10, 1985, Ser. No. 807,202
Claims priority, application Australia, Jan. 28, 1983, PF7824
Int. Cl.[4] A63C *15/06*
U.S. Cl. 441—70 9 Claims



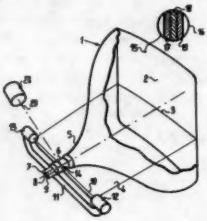
1. A ski board comprising an elongated ski body having an upper surface upon which a rider stands in use of the board, a first foot engaging means located generally centrally of the said surface and adapted to receive a foot of the rider so that the foot extends at least partly transverse of said surface; a second foot engaging means rearward of said first foot engaging means and adapted to engage the other foot of the rider so that said other foot extends at least partly transverse of said surface; each engaging means including an elongated flexible strap; first and second securing means attaching the ends of each strap to said surface at spaced locations so that the straps form loops within which the user's feet are located; and wherein the first securing means adjustably attaches the ends of the strap of said first securing means to said surface at locations spaced transversely of the board, with the ends of the strap of said first securing means being movably attached to said surface, the angle of the strap being independently movably adjustable relative to the longitudinal axis of the board to enable the user's foot engaged therein to be angularly adjustable as it extends generally transverse of the board.

4,604,071

PROCESS FOR ALIGNING AND CENTERING AN ASSEMBLY OF ELECTRON-GUNS ON A COLOR TELEVISION TUBE AND DEVICE FOR CARRYING OUT THE PROCESS

Claude Pons, Grottaferrata, Italy, assignor to Videocolor, Montrouge, France

Filed Jun. 19, 1984, Ser. No. 622,331
Claims priority, application France, Jun. 21, 1983, 83 10240
Int. Cl.[4] H01J *9/42*
U.S. Cl. 445—4 **20 Claims**



15. In a combination color television tube having an electro-luminescent screen and a neck extending therefrom, contiguous luminophorous element bands formed vertically on the inner surface of the electro-luminescent screen, a gun assembly having three guns placed to the rear of the neck and along the longitudinal axis from the center of the screen for striking the luminophorous element bands with three beams, the gun assembly further including marker means, a method for aligning and centering the gun assembly to the luminophorous element bands for canceling a positioning error formed therebetween, the method comprising:

placing two optical means on opposing sides of the gun assembly for forming a symmetry plane perpendicular to the bands and itnersecting the gun assembly;

defining from the perpendicular relationship between the symmetry plane and the bands a reference marker corresponding to an alignment value for proper convergence of the three beams;

projecting a luminous beam onto the marker means of the gun assembly for establishing an angle between the luminous beam and the symmetry plane, the angle being representative of the positioning error;

sensing, via analyzer means located along the symmetry plane, at least one image from the marker means;

contrasting the at least one of the images with the alignment value for determining a positioning error value; and

positioning the gun assembly in response to the positioning error value for canceling the positioning error angle between the symmetry plane and the luminous beam on a real-time basis.

4,604,072

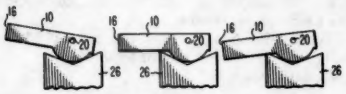
METHOD FOR ENGAGING SUPPORT STUDS INTO SHADOW MASK SPRING APPARATUS

Gerald M. Allardyce, Avoca, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 3, 1984, Ser. No. 627,534
Int. Cl.[4] H01J *29/07*
U.S. Cl. 445—30 **1 Claim**

1. A method for placing a shadow mask assembly into a CRT panel having studs, said method comprising:

engaging a circualr arcuate edge of a shadow mask spring having a stud receiving hole at the center of curvature of said edge with a locator having a concave top surface; and



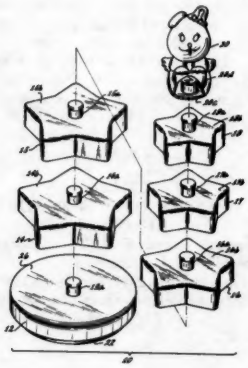
moving said locator to thereby move said panel assembly until said spring hole receives a stud.

4,604,073

TAKE-APART ROCKING STACK TOY

James R. Livesey, Fountain Valley; William Hart, Palos Verdes Estates, and Harold A. Hartleben, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 19, 1984, Ser. No. 683,736
Int. Cl.[4] A63H *33/04, 13/38*
U.S. Cl. 446—117 **8 Claims**



1. In a toy, the combination comprising:

a hollow base member having a generally spherically shaped bottom surface means configured for rocking engagement with a supporting surface and an upper generally planar surface having a generally centrally located upwardly extending post means formed integrally therewith for providing a coupling extension, said generally spherically shaped bottom surface means including a substantially spherically shaped surface and generally centrally located substantially flattened portion on said substantially spherically shaped surface;

a plurality of other hollow members, each of said other hollow members having generally parallel surfaces, one of said surfaces having a generally centrally positioned post means extending therefrom for providing a coupling extension configured generally identical to the post means of said hollow base member, and the other of said surfaces having formed generally centrally therein a generally cup-shaped socket means configured for mating engagement with one of said post means and removably stacking each of said other hollow members to another of said other hollow members in order to allow a number of said other hollow members to be supported on said hollow base member and rocked by said spherically shaped bottom surface means; and

a figure member having a base portion with a generally cup-shaped socket means formed therein for mating engagement with one of said post means and removeably assembling said plurality of other hollow members in

generally interlocking relation, said hollow base member having a wall thickness greater than the wall thickness of each of said other hollow members, said wall thickness of said other hollow members varying in size so that at least two of said other hollow members have different size wall thickness and said other hollow members are capable of being stacked upon one another in order of descending wall thickness size.

4,604,074

PUSH TOY

T. Scott Engle, Manhattan Beach, and Jeffrey B. Poznick, La Crescenta, both of Calif., assignors to Mattell, Inc., Hawthorne, Calif.

Filed Aug. 30, 1985, Ser. No. 771,544
Int. Cl.[4] A63H *29/08*
U.S. Cl. 446—171 **15 Claims**

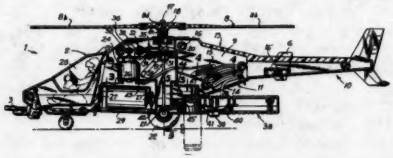
1. In a push toy, the combination comprising:
housing means;
at least one wheel rotatably coupled to said housing means and adapted for engaging a surface;
handle means coupled to said housing means for enabling an operator to move said at least one wheel on a surface with said handle means in a generally upright position;
at least partially transparent continuous conduit means on said handle means;
impeller means coupled for rotation upon rotation of said at least one wheel, said impeller means communicating with a portion of said conduit means;
a number of spherical elements movably positioned within said conduit means, the number of such elements and the configuration of said conduit means enabling, upon rotation of said impeller means, the movement of said spherical elements within said conduit means.

4,604,075

TOY HELICOPTER WITH A CONTROL UNIT

Lawrence D. Richards, Huntington Station, N.Y., and Johnny S. C. Yuen, West Point, Hong Kong, assignors to Arco Industries, Harbour City, Hong Kong

Filed May 22, 1985, Ser. No. 736,954
Int. Cl.[4] A63H *27/00*
U.S. Cl. 446—232 **4 Claims**



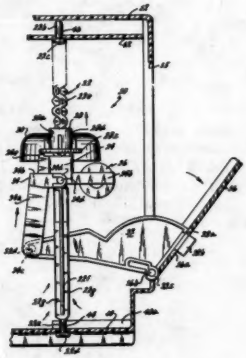
1. A toy helicopter which comprises:
(a) a housing;
(b) a rotor blade attached to a top portion of a driving shaft which extends vertically through said housing;
(c) a motorized means for rotating said rotor blade connected to said driving shaft;
(d) a self-contained control unit removably insertable into said housing and having a switch mechanism connected to a first conductor end of a wire cord, and a second conductor end of said wire cord being connected to said motorized means, said control unit when inserted in said housing having a first position whereby said control unit is in a plane parallel to a plane of said rotor blade and said control unit activates an electrical circuit of said motorized means causing the toy helicopter to travel along a horizontal surface, and a second position whereby said control unit is in a plane perpendicular to said plane of said rotor blade and activates said electrical circuit permitting control of the toy helicopter by hand, and said control unit takes a third position when removed from said housing whereby said control unit is remote from the toy helicopter.

4,604,076

TOY STOVE WITH SIMULATED TIMER

Raymond M. St. Pierre, Hawthorne, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed May 22, 1985, Ser. No. 736,998
Int. Cl.[4] A63H *3/52, 5/00*
U.S. Cl. 446—418 **22 Claims**



1. In a toy stove, the combination comprising:
an enclosure having an opening simulating an oven opening;
a door hingedly coupled to said enclosure for closing and providing access through said opening;
bell means mounted within said enclosure;
timer means mounted within said enclosure; and
actuating means within said enclosure interoperatively interconnecting said door, said timer means and said bell means for enabling actuation of said bell means a predetermined time after closing of said door.

4,604,077

CONSTANT-SPEED TRIPOD JOINT HAVING AN AXIAL RETENTION

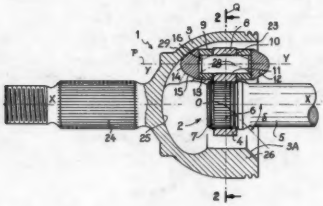
Michel A. Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Continuation of Ser. No. 473,434, Mar. 9, 1983, abandoned. This application Mar. 12, 1985, Ser. No. 710,525

Claims priority, application France, Mar. 15, 1982, 82 04318

Int. Cl.[4] F16D 3/20, 3/30

U.S. Cl. 464—111 9 Claims



1. A constant-speed tripod joint comprising:

a bell element provided internally with three pairs of tracks, each said track having a configuration such that a center line thereof is curved;

a tripod element axially fixed within said bell element and having an axis of rotation, said tripod element having three arms extending radially outward therefrom, each said arm having a pivot axis parallel to said axis of rotation;

each said arm having rotatably and slidably mounted thereon a roller engaging a respective said pair of tracks;

each arm having means for mounting each said roller for pivotal movement about only a respective single axis which extends substantially parallel to said axis of rotation of said tripod element and which comprises said pivot axis of the respective said arm; and

said tripod element being axially retained in said bell element by said rollers bearing along edge portions of the respective said tracks and by contact of each said roller with a respective point of an inner spherical surface of said bell element.

4,604,078

THREE-STAGE SPEED CHANGE FRONT DERAILLEUR

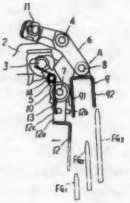
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 22, 1985, Ser. No. 714,914

Claims priority, application Japan, Mar. 29, 1984, 59-63013

Int. Cl.[4] F16H 7/00

U.S. Cl. 474—80 5 Claims



1. A three-stage speed change front derailleur for shifting a driving chain to one of three speed change stages respectively corresponding to three front chain gears of different diameter comprising:

a fixing member, a pair of linkage members, and a movable member provided with an inner guide plate, an outer guide plate and a shift plate, said shift plate functioning with said inner guide plate to shift said driving chain to a middle speed change stage and being positioned below said inner guide plate so as to serve to shift said driving chain from a smaller diameter front chain gear to a middle diameter front chain gear, said shift plate being pivoted to said movable member in relation of being swingable between a speed change operating position where said chain can be shifted by said shift plate to said middle diameter chain gear and a position where said shift plate moves away from said speed change operating position as said movable member moves from a position corresponding to said middle speed change state toward a position of shifting a chain to a larger diameter front chain gear, said front derailleur having biasing means for biasing said shift plate toward said speed change operating position.

4,604,079

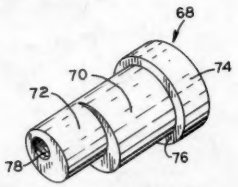
SPEED CHANGER FOR ELECTRIC MOTOR

Kenneth D. Parrish, R.R. #4, Decatur, Ind. 46733

Filed Nov. 6, 1984, Ser. No. 668,744

Int. Cl.[4] F16H 7/14

U.S. Cl. 474—114 15 Claims



1. A motor speed changer assembly for a motor having an output shaft, an end face and a plurality of throughbolts extending through said end face, said assembly comprising;

mounting base means adapted for mounting on said end face;

a plurality of apertures in said base, said apertures arranged to align generally axially parallel with said throughbolts;

a jackshaft rotatably mounted on said base and arranged with its axis parallel to said output shaft;

a pair of pulleys, one each of said pulleys being mounted respectively on said output shaft and jackshaft;

a belt connecting said pulleys;

a plurality of fastener means for fastening said base to said end face, each fastener comprising a cylindrical portion rotatably received in one of said apertures, shoulder means at one end of said cylindrical portion for abutting an end surface of said base and an eccentric portion connected to said cylindrical portion opposite said shoulder and secured to said through bolt ends.

4,604,080

TOOTHED DRIVE BELT

Takahide Mizuno, Kobe, Japan, assignor to Mitsuboshi Belting Ltd., Japan

Filed Oct. 11, 1984, Ser. No. 660,009

Claims priority, application Japan, Oct. 12, 1983, 58-157501[U]; Oct. 12, 1983, 58-157502[U]; Oct. 13, 1983, 58-158780[U]; Oct. 17, 1983, 58-161108[U]

Int. Cl.[4] F16G 1/28; F16H 7/02

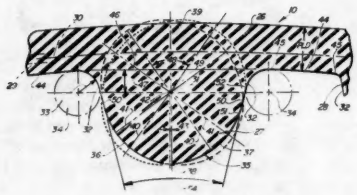
U.S. Cl. 474—153 19 Claims

1. Drive means comprising:

a pulley having a radially outwardly opening belt-engagement groove defined by an annular series of alternating grooves and teeth, each of the grooves having an inner root being defined in cross section by a circular arc defining said root of the grooves and having opposite outer

ends, a pair of straight lines extending one each outwardly from said opposite outer ends of the root arcs and having outer distal ends, and a pair of circular entrance arcs extending one each outwardly from said distal ends of the straight lines, the teeth between said grooves having tip surfaces, each tip surface being defined by a straight line interconnecting opposed ends of the circular entrance arcs of the grooves at the opposite sides of the tooth; and

a drive belt having a longitudinally extending series of alternating grooves and teeth at a constant pitch, each belt tooth defining a centerline and being defined in longitudi-



nal cross section by a tip surface defined by a pair of elliptical arcs meeting at said centerline of the tooth and defining outer ends, said elliptical arcs defining elipses having long and short axes, the long axes of the ellipses defining the elliptical arcs being at equal and opposite angles to the centerline of the tooth, and opposite flanks defined by circular arcs extending one each from the outer ends of the elliptical arcs, said pulley grooves and belt teeth comprising means for causing backlash between said belt teeth and said pulley groove in static engagement to increase linearly from the belt tooth flank to the belt tip face.

4,604,081

TOOTHED BELT

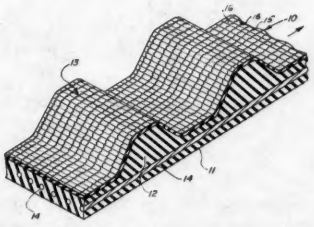
Satoshi Mashimo, Akashi; Masayuki Tanaka; Yoshio Yamaguchi, both of Kobe, and Takashi Kinoshita, Hyogo, all of Japan, assignors to Mitsuboshi Belting Ltd., Japan

Filed Oct. 4, 1984, Ser. No. 657,739

Claims priority, application Japan, Oct. 7, 1983, 57-188795

Int. Cl.[4] F16G *1/28*

U.S. Cl. 474—205 **17 Claims**



1. In a toothed belt having longitudinally spaced teeth and defining a pitch line, the improvement comprising

a fabric adhered to the belt on said teeth including warp and weft yarns, said weft yarns having a configuration providing a preselected elasticity and being formed of polyamide synthetic resin having a limiting viscosity of greater than approximately 1.30.

4,604,082

V-BELT MECHANISM

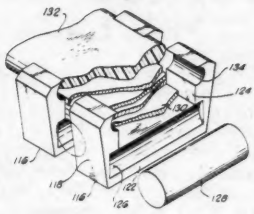
Torao Hattori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,252

Claims priority, application Japan, Sep. 29, 1982, 57-168434

Int. Cl.[4] F16G *1/21*

U.S. Cl. 474—242 **2 Claims**



1. A V-belt assembly comprising

a pulley having a V-groove with a coating of resilient material, and

a V-belt for engagement with said pulley, said V-belt including a continuous loop of a tension member having a thin metal tension member and a flexible tension member and a plurality of spaced blocks of metal having inclined faces, said blocks slidably mounted on said tension member, and

a roller positioned between adjacent sides of said spaced blocks to space said blocks during engagement with said pulley.

4,604,083

MACHINE FOR MANUFACTURING FOLDED BOXES

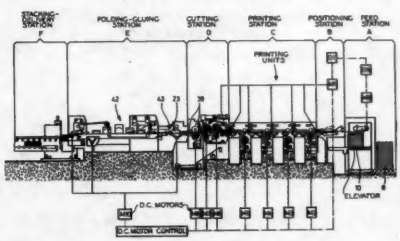
Jean J. Barny, Lausanne, and Roger Roch, Cossonay-Ville, both of Switzerland, assignors to Bobst SA, Lausanne, Switzerland

Filed Feb. 10, 1984, Ser. No. 578,862

Claims priority, application Switzerland, Feb. 21, 1983, 944/83

Int. Cl.[4] B31B *49/00*

U.S. Cl. 493—34 **6 Claims**



1. A machine for manufacturing folded boxes with sheet material, comprising:

a plurality of successive stations operating in synchronism, including a feed station, a centering station, a printing station, a cutting station, a folding and gluing station and a stacking and delivery station;

said feed station including stack receiving means for holding a stack of sheets, stack feeding means for feeding a stack to said stack receiving means, stack centering means for centering a received stack with respect to the center line of the machine, and first feed means for feeding the uppermost sheet of the stack to said centering station;

said centering station including set centering means for centering a sheet with respect to the center line, and

second feed means for feeding a centered sheet to said printing station;

said printing station comprising a plurality of selectively operable printing units including printing cylinders positioned to print on the bottom surface of a sheet;

said cutting station comprising first and second successively operating cutting units for slotting a sheet along predetermined fold lines and for cutting a sheet to a predetermined form, said second cutting unit mounted for movement to a non-working position;

said folding and gluing station comprising a telescopic conveyor to be extended into the working space of said second cutting unit when the same is in its non-working position, a folder for folding a sheet along the predetermined fold lines, and a gluer for gluing together opposite transverse marginal portions of a folded sheet to form a box form;

said stacking and delivery station comprising stacking means for stacking the box forms, counting means for counting the stacked forms, and stack conveying means for conveying a stack out of the machine in response to said counting means reaching a predetermined count;

a plurality of D.C. motors connected to and driving said stations in synchronism;

lateral shifting means in each of said stations;

a plurality of asynchronous A.C. motors connected to and operable to shift said lateral shift means at each of said stations; and

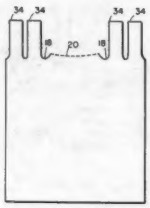
a machine control system including a program and data processing control circuit for storing and processing operating parameters of the machine, a register control circuit for sensing sheet registration and producing corresponding data, a D.C. control circuit connected to said D.C. motors for controlling synchronism and registration, and an A.C. control circuit connected to said A.C. motors for controlling lateral sheet displacement.

4,604,084

THERMOPLASTIC BAG, BAG PACK AND METHOD OF MAKING THE SAME

Timothy W. Pistner, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 672,756, Nov. 19, 1984, Pat. No. 4,562,925.
This application May 29, 1985, Ser. No. 738,800
Int. Cl.[4] F16G *13/02*
U.S. Cl. 493—226 4 Claims



1. A method for forming a thermoplastic film handled sack comprising:

(a) forming a collapsed thermoplastic film tube, heat-sealed transversely at each end thereof;

(b) folding opposite sides of the sealed tube toward but spaced from each other, along lines perpendicular to said heat-seals; and

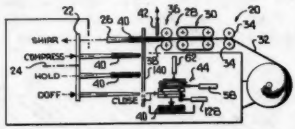
(c) removing, from one end of the folded structure, sufficient film to form a bag mouth opening and a pair of single-film handle loops at opposite ends of said bag mouth opening.

4,604,085

SAUSAGE CASING AUTOMATIC CLOSING METHOD

Thomas W. Martinek, Covington, Ind., assignor to Teepak, Inc., Oak Brook, Ill.

Continuation of Ser. No. 94,270, Nov. 14, 1979, Pat. No. 4,475,895. This application May 4, 1984, Ser. No. 587,347
Int. Cl.[4] A22C *13/00*
U.S. Cl. 493—259 10 Claims



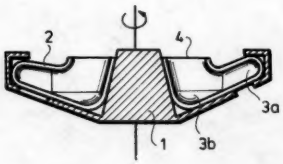
1. A method of handling a strand of shirred food casing with a device comprising a strand gripper, first and second carrier means for the strand gripper, said first and second carrier means being integral with one another, the second carrier means being movable relative to the first carrier means, said strand gripper being mounted on the second carrier means and comprises a pair of axially elongated jaws, said strand handler including first drive means for moving the first and second carrier means and the strand gripper in a first direction, and a second drive means for moving the second carrier means and strand handler in a second direction, which method comprises the steps of spacing the axially elongated jaws of the strand gripper sufficiently to form a strand receptacle, doffing the strand from a shirring mandrel into said receptacle, moving the jaws together to grip the strand, aligning the jaws and a terminal end of the strand with an end closure mechanism, forming an end closure at the terminal end of the strand, and thereafter opening the jaws of the strand gripper sufficiently to release the strand.

4,604,086

MULTIFUNCTION CENTRIFUGE

Éva Benko, Budapest; István Csabankó, Esztergom; Anikó Porkoláb; Zsolt Szabó, both of Budapest, and Gábor Takács, Pomáz, all of Hungary, assignors to "Labor" Muszeripari Muvek, Hungary

Filed Jan. 23, 1985, Ser. No. 693,732
Claims priority, application Hungary, Jan. 26, 1984, 319/84
Int. Cl.[4] B04B *5/02*
U.S. Cl. 494—16 2 Claims



1. A multifunction centrifuge comprising a rotor rotatable about a vertical axis and at least two centrifuge bowls disposed about the rotor, the improvement consisting in that the centrifuge bowls are rigidly connected to the rotor by bracket-like retaining walls thereof and each centrifuge bowl has an outer centrifugation chamber of sack-like or cylindrical shape having a constant cross-section with an outwardly facing bottom and an inner gravitational chamber connected to said outer chamber for bidirectional free communication, said gravitational chamber lying lower than the said outer chamber.

4,604,087

AQUEOUS HUMOR DRAINAGE DEVICE

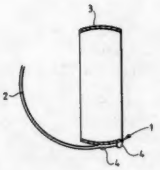
Neil H. Joseph, 54 Hereford Road, London W.2., England

Filed Jun. 21, 1985, Ser. No. 747,409

Claims priority, application United Kingdom, Feb. 26, 1985, 8504905

Int. Cl.[4] A61M *27/00*

U.S. Cl. 604—9 14 Claims



1. A device of one piece construction for draining aqueous humor from an eye composed entirely of supple, biologically inert material, the device comprising a drainage body for distributing drained aqueous humor over a relatively large area comprising a band having a width of at least 5 mm, and a length sufficient for the band to pass substantially around, and be sutured to, the sclera of said eye in an equatorial position; a drainage tube integrally and firmly fixed to the drainage body and of sufficient length that an end thereof may be safely disposed within the anterior chamber of said eye; and a pressure gradient limiting slit valve means having a predetermined opening pressure disposed directly proximate to the area of fixation of the drainage tube to the drainage body establishing a direct route of aqueous humor flow between the interior of the drainage tube and a surface of the drainage body, whereby excessive intraocular pressure may be relieved by the controlled drainage of aqueous humor from the anterior chamber of said eye.

4,604,088

INSTRUMENT FOR INDIRECT TREATMENT WITH A HOT AIR FLOW AND MOXA SMOKE

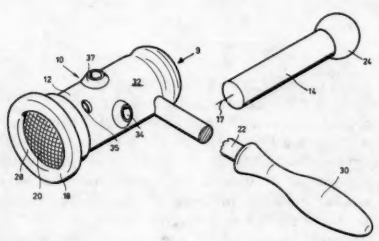
Friedrich Nottbohm, Am Reisenbrook 24 a, D-2000 Hamburg 67, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,558

Claims priority, application European Pat. Off., Jun. 25, 1983, 83106228.6; Fed. Rep. of Germany, Sep. 15, 1983, 3333271

Int. Cl.[4] A61B *17/36*

U.S. Cl. 604—24 6 Claims



1. An instrument for the indirect self-treatment of chronic pain problems by humans with a hot mixture of air and moxa smoke, particularly head and back pains, said instrument comprising a hollow smoke chamber for receiving a moxa herb rolled in the form of a cigar and having a central opening provided in one end thereof through which it is possible to insert the moxa cigar into the smoke chamber together with means for holding the moxa cigar in the smoke chamber in a precise fitting manner, the opposite end of the smoke chamber having an enlarged opening therein closed by a removable cap which has a protective grid, said smoke chamber having a plurality of further openings around the periphery thereof between the two said ends for the supply of combustion air to the moxa cigar while burning, and a handle secured to the smoke chamber to facilitate handling of the instrument while it is hot during treatment, and wherein the means for holding the moxa cigar in the first mentioned central opening within the hollow smoke chamber in a precise fitting manner comprises a removable and slidable elongated plunger rod forming a press fit with said first mentioned central opening and having a pin formed on the end thereof for attaching and securing the end of a moxa cigar thereto for insertion of the moxa cigar with its opposite free end lit and burning into the hollow interior of the smoke chamber via the first mentioned central opening and for retention of the burning free end of the moxa cigar at a set safe distance from the protective grid.

4,604,089

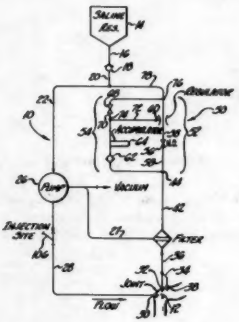
PRESSURE REGULATED IRRIGATION SYSTEM FOR ARTHROSCOPY

John A. Santangelo, East Freetown, and Charles B. Worrick, III, Hanson, both of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Aug. 15, 1983, Ser. No. 523,312

Int. Cl.[4] F16K *1504;* A61B *17/32*

U.S. Cl. 604—30 18 Claims



6. A pressure regulated irrigation system comprising:

means for providing access to and egress from the irrigation site;

means in fluid communication with said access and egress means for providing a closed loop fluid circuit about the irrigation site;

means for connecting a reservoir of irrigation fluid into said circuit;

pump means in fluid communication with and connected in series with said reservoir connection means; and,

a pressure regulation circuit in fluid communication with and connected in series with said pump means and said reservoir connection means, said pressure regulation circuit including an operator first input means for elevating the pressure in said irrigation site to a desired level in response to an operator first input signal and for maintaining said pressure at said desired level when said operator first input signal is terminated; and,

said pressure regulation circuit further including an operator second input means for reducing the pressure at said irrigation site in response to an operator second input signal and for maintaining said pressure at said reduced level when said second input signal is terminated;

wherein said pressure regulation circuit includes a flow restriction branch and a pressure accumulation branch connected in parallel with said flow restriction branch;

said flow restriction branch including said operator first input means and a pressure regulator downstream of and connected in series with said operator first input means;

said pressure accumulation branch including said operator second input means, a pressure accumulation means upstream of and connected in series with said operator second input means and a check valve means upstream of and connected in series with said pressure accumulation means;

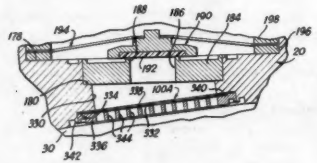
means for transmitting a signal representative of the pressure in said pressure accumulation branch to control said pressure regulator in said flow restriction branch; and,

said pressure regulator including a diaphragm-operated pressure regulator and said means for transmitting a signal representative of the pressure in said pressure accumulation branch including a conduit connected to the donwstream side of said pressure accumulator and in fluid communication with said diaphragm of said diaphragm-operated pressure regulator.

4,604,090
COMPACT IMPLANTABLE MEDICATION INFUSION DEVICE

Robert H. Reinicke, Mission Viejo, Calif., assignor to Consolidated Controls Corporation, El Segundo, Calif.

Filed Nov. 22, 1983, Ser. No. 554,197
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—118 **22 Claims**



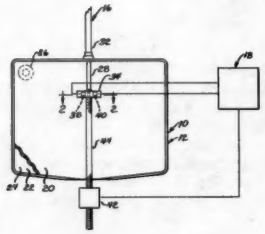
1. An implantable medication infusion unit, comprising a flat generally disc shaped manifold having a shallow recess on one face thereof, a flexible circular diaphragm secured at its periphery to the edge of said recess to form with said one face of said manifold a medication reservoir, means accessible from the exterior of said unit through a first penetrable septum mounted in the other face of said manifold for filling said medication reservoir, said last named means including a fill check valve, a pulsatile pumping unit mounted in said manifold and including an inlet check valve mounted in said manifold, a second penetrable septum mounted in said manifold, means defining a chamber beneath said second penetrable septum, and a passage in said manifold interconnecting said chamber and said reservoir, whereby the space between said fill check valve and said inlet check valve may be evacuated through said penetrable second septum.

4,604,091
Patent Not Issued For This Number

4,604,092
LIQUID DRAINAGE SYSTEM WITH VERTICAL MOVABLE LIGHT EMITTER AND DETECTOR

Brian H. Silver, Skokie, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 484,109, Apr. 11, 1983, abandoned.
This application Jan. 29, 1983, Ser. No. 823,828
Int. Cl.[4] A61M *5/005*
U.S. Cl. 604—246 **10 Claims**



1. A liquid drainage system comprising:

a container having a cavity to receive the liquid;

an associated light emitter and light detector being changeable between a first state with the light from the emitter impringing upon the detector, and a second state with the light form the emitter passing away from the detector dependent upon the presence of liquid in the container between the emitter and detector; and

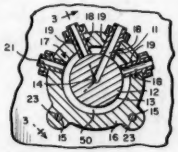
means for moving the emitter and detector vertically along the container comprising means for housing the light emitter and light detector in fixed relationship to one another, a vertical threaded shaft arranged alongside the container, the housing means being mounted on top of the threaded shaft, and stepper motor means located beneath and in fixed relationship to the container, the vertical shaft being rotatable by the stepper motor means whereby upon energization of the stepper motor means, the housing and threaded shaft are caused to travel vertically alongside the container.

4,604,093

APPARATUS AND METHOD FOR ADMINISTERING MULTIPLE FLUID INFUSIONS

Eric W. Brown, Redondo Beach, and Henry T. Tai, Pacific Palisades, both of Calif., assignors to I-Flow Corporation, Redondo Beach, Calif.

Filed Jun. 12, 1984, Ser. No. 619,847
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—248 25 Claims



1. A valve demountable on a control apparatus for automatically providing selective communication between one of a plurality of available fluid sources and a catheter tube, the valve comprising:

a hollow cylindrical housing having a plurality of input sites for connection with said fluid sources;

a core member, rotatably engaged within said housing, having a planar surface on each end and an output passageway extending through said core member from an access hole in a circumference of said core member to an output hole in one of said planar surfaces connected to said catheter tube, said circumference of said core member sealing said input sites such that fluid is prevented from escaping from said input sites except when said access hole is aligned with one of said input sites to provide communication between said input site and said output passageway;

conduit means for directing fluid from one of said input sites around said remaining input sites so that said fluid from said one of said input sites is in communication with said access hole whenever said access hole is positioned between two adjacent input sites; and

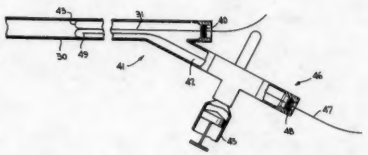
gear means coupled to said core member for transmitting rotational movement from said control apparatus to said core member.

4,604,094

TOPOSCOPIC CATHETER AND METHOD OF FABRICATION

Daniel R. Shook, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Sep. 6, 1984, Ser. No. 647,728
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—271 34 Claims



1. A catheter assembly comprising:

a primary catheter in the form of an elongated hollow tube having an interior wall and an open distal end;

an everting catheter disposed within said primary catheter and having an open head end facing away from said distal end of said primary catheter and secured to the interior wall of said primary catheter; and

means for selectively everting said everting catheter along said interior wall in a direction toward and out through the open distal end of said primary catheter;

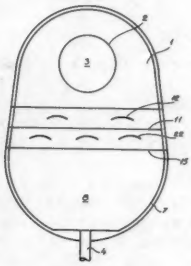
wherein said open head end of said everting catheter is secured to said interior wall along a predetermined length of said interior wall which is recessed from said distal end of said primary catheter.

4,604,095

RETURN VALVE FOR A BAG FOR COLLECTING LIQUID EXCRETIONS FROM THE HUMAN BODY

Peter Samuelsen, Rungsted Kyst, Denmark, assignor to Coloplast A/S, Denmark

Filed Dec. 30, 1983, Ser. No. 567,059
Claims priority, application Denmark, Jan. 4, 1983, 10/83
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—323 4 Claims



1. In a bag for collecting liquid excretions from a body comprising coupling means for attachment to fastening means placed around an opening in the body, a drainage inlet for a liquid collection reservoir, a first return valve means of plural films having an inner and outer face, said valve means being located between the drainage inlet and the reservoir in the shape of at least one film flap resting against a film wall and having a downward-facing opening, and reservoir means for collecting said liquid excretions, the improvement which comprises:

(a) means for diverting the flow of said liquid excretions between the drainage inlet and the reservoir means;

(b) a second return valve means of plural films having an inner and outer face located downstream from and in series with the direction of flow of the first return valve means, the second return valve means being in the shape of at least one film flap resting against a film wall and having a downward-facing opening into said reservoir means;

(c) an intermediate fluid-collecting chamber between the first and second return valve means; and

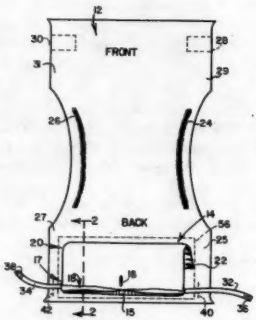
(d) by-pass passage means, formed by discontinuous horizontally extending bonds between an outer face of the upstream first return valve means and the inner face of the second valve means and in its open position for receiving liquid from the reservoir and directing it into the intermediate chamber between the first and second return valve means whereby to return the liquid to the reservoir means exteriorly of the outer faces of the first and second valve means and therefore avoid backup of body excretions.

4,604,096

DISPOSABLE DIAPER WITH INTEGRAL DISPOSAL SYSTEM

Raymond S. Dean, Medford, and William A. Barabino, North Reading, both of Mass., assignors to Physiological Research Associates, N. Reading, Mass.

Filed Aug. 26, 1985, Ser. No. 770,226
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 A **20 Claims**



1. A diaper assembly with integral disposal system, comprising:

a disposable diaper;

an envelope integrally carried on the outside of said diaper and having a mouth for receiving said diaper when soiled; and

strap means for engaging a section of said diaper with another section of said diaper to secure said diaper on a wearer in a use configuration and restricting the mouth of said envelope in a disposal configuration.

4,604,097

BIOABSORBABLE GLASS FIBERS FOR USE IN THE REINFORCEMENT OF BIOABSORBABLE POLYMERS FOR BONE FIXATION DEVICES AND ARTIFICIAL LIGAMENTS

George A. Graves, Jr., Bellbrook, and Binod Kumar, Centerville, both of Ohio, assignors to University of Dayton, Dayton, Ohio

Filed Feb. 19, 1985, Ser. No. 702,526
Int. Cl.[4] C04B *33/24, 35/44*
U.S. Cl. 623—11 **15 Claims**

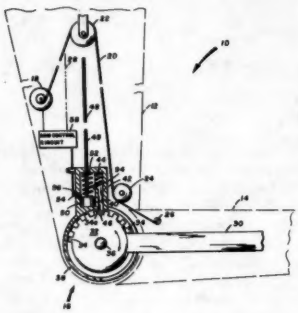
1. A spun or drawn glass fiber, which is bioabsorbable and useful in the area of medical implants, comprising calcium oxide (CaO) and phosphrous pentoxide (P_2O_5).

4,604,098

PROSTHETIC ELBOW WITH A MOTOR-DRIVEN RELEASE MECHANISM

Woodrow Seamone, Rockville, and John H. Loveless, Westminster, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Jul. 17, 1984, Ser. No. 631,705
Int. Cl.[4] A61F *2/58*
U.S. Cl. 623—60 **32 Claims**



1. A prosthetic arm having:

a forearm;

an elbow joint having a locking means and an engageable means which is engaged by the locking means to prevent bending of the elbow;

an upper arm connected to the forearm via the elbow joint;

a motor connected mechanically to drive the forearm relative to the upper arm about the elbow joint;

an actuable withdrawing means connected to withdraw the locking means from engagement with the engageable means;

a drive circuit connected electrically to the motor for regulating operation thereof;

a switching means connected to the withdrawing means, and which is closed upon initial actuation of the withdrawing means;

a pulsing circuit connected electrically to be triggered upon closure of the switching means and to generate a pulsed output to the motor via the drive circuit when so triggered, such that the elbow is bent slightly;

wherein further actuation of the withdrawing means disengages the locking means from the engageable means.

4,604,099

PROCESS FOR PRINTING CELLULOSE-CONTAINING TEXTILE MATERIAL WITH FOAM-CONTAINING REACTIVE DYES AND ADDITION OF (METH) ACRYLAMIDE POLYMERS

Hans-Ulrich Berendt, Allschwil, and Paul Schäfer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 23, 1985, Ser. No. 694,189

Claims priority, application Switzerland, Jan. 30, 1984, 415/84; May 18, 1984, 2457/84

Int. Cl.[4] D06P *1/52, 3/66*

U.S. Cl. 8—477 23 Claims

1. A process for printing cellulose-containing textile material with a reactive dye which process comprises printing the textile material with a foamed aqueous preparation containing at least one reactive dye, at least one foaming agent and a homopolymer or co-polymer of acrylamide or methacrylamide; or a graft polymer obtained from an adduct of an alkylene oxide on an at least trihydric aliphatic alcohol having 3 to 10 carbon atoms and acrylamide or methacrylamide, and subsequently fixing the dye by a heat treatment.

4,604,100

PROCESS FOR THE PREPARATION OF GRANULAR DYE FORMULATIONS FROM POLYETHYLENE GLYCOL MELT

Dieter Schneider; Heinz Knies, both of Grenzach-Wyhlen, and Gerhard Kaudela, Fischingen, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,785

Claims priority, application Switzerland, Mar. 15, 1984, 1289/84

Int. Cl.[4] B01J *2/28;* C09B *67/42*

U.S. Cl. 8—526 17 Claims

1. A process for the preparation of a granular dye formulation, which process comprises:

a. preparing a fluid mixture comprising: (i) melted polyethylene glycol and (ii) a water-containing dye containing at least 5 percent water by weight of the weight of said dye;

b. preparing granules from the fluid mixture of step (a); and

c. if necessary, adjusting the water content of the fluid mixture of step (a) prior to preparing the granules of step (b) until the viscosity is sufficient to permit atomization or tabletting of said fluid mixture.

4,604,101

AFTER TREATMENT OF ANIONIC DYEINGS, PRINTINGS AND OPTICAL BRIGHTENINGS ON TEXTILE FIBERS

Bruno Kissling, Hagendorf, and Tibor Robinson, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Feb. 21, 1985, Ser. No. 703,699

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406631

Int. Cl.[4] D06L *3/12;* D06M *15/54;* D06P *1/39*

U.S. Cl. 8—551 19 Claims

1. A process for the after-treatment of hydroxy group- or nitrogen-containing textile fibres which have been dyed or printed with an anionic dyestuff or brightened with an anionic optical brightener comprising the step of treating the dyed, printed or brightened fibres, simultaneously or sequentially, with

(A) a polymeric reaction product of a monofunctional or polyfunctional amine having one or more primary and/or secondary and/or tertiary amino groups with cyanamide, dicyandiamide, guanidine or bisguanidine in which up to 50 mole percent of the cyanamide, dicyandiamide, guanidine or bisguanidine may be replaced by a dicarboxylic acid or a mono- or di-ester thereof, said product (A) containing at least one free hydrogen atom linked to a nitrogen atom, and

(B) a quaternary polyalkylene polyamine which is a water-soluble reaction product of an N,N-tetraalkylalkylenediamine with a dihaloalkane, or of a secondary alkylamine with an epihalohydrin.

4,604,102

FUEL COMPOSITIONS

Edward F. Zaweski, and Leonard M. Niebylski, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 25, 1985, Ser. No. 801,300

Int. Cl.[4] C10L *1/18*

U.S. Cl. 44—57 13 Claims

1. Distillate fuel for indirect injection compression ignition engines containing, in an amount sufficient to minimize coking, especially throttling nozzle coking in the prechambers or swirl chambers of indirect injection compression ignition engines operated on such fuel, at least the combination of (i) organic nitrate ignition accelerator and (ii) an esterified cyclic dehydration product of sorbitol which, when added to said fuel in combination with said organic nitrate ignition accelerator minimizes said coking.

4,604,103

DEPOSIT CONTROL ADDITIVES—POLYETHER POLYAMINE ETHANES

Curtis B. Campbell, Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 403,607, Jul. 30, 1982, abandoned. This application Dec. 16, 1985, Ser. No. 809,101

The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.

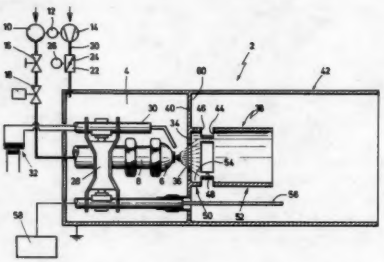
Int. Cl.[4] C10L *1/22*

U.S. Cl. 44—72 5 Claims

1. A fuel composition comprising a major portion of hydrocarbon boiling in a gasoline range, and from 30 to about 10,000 ppm of hydrocarbyl polyoxyalkylene polyamine ethane of molecular weight from about 300 to about 2500 having the formula

$$R\text{-}(OCH_2CH)_x OCH_2CH_2\text{-}NR''R'''$$
$$\quad\quad\quad

said upstream portion comprises a solid wall between said shield and said radial passage, wherein the axial length of said solid wall is between 0.1-multiple to 0.6-multiple of the inner diameter of the downstream portion of the mixing tube,



a substantially cylindric flame tube whose upstream end is sealingly connected with the end wall of the combustion air supply means, wherein the mixing tube is positioned within said flame tube in an annularly spaced relationship thereto.

4,604,105

FLUIDIZED BED GASIFICATION OF EXTRACTED COAL

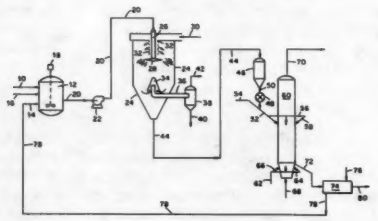
Dolores C. Aquino, Houston, Tex.; Philip L. DaPrato, Westfield, N.J.; Toby R. Gouker, Baton Rouge, La., and Peter Knoer, Houston, Tex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 6, 1984, Ser. No. 628,079

Claims priority, application European Pat. Off., Aug. 24, 1983, 68757

Int. Cl.[4] C10J *3/54*

U.S. Cl. 48—197 R **10 Claims**



1. A process for the fluidized bed gasification of carbonaceous solids, comprising:

introducing a slurry of carbonaceous solids to an extraction zone operated at atmospheric pressure to contact an aqueous solution at a pH above 13.5, which includes a water-soluble gasification catalyst comprising an alkali metal hydroxide or a mixture of an alkali metal hydroxide with at least one alkali metal salt, at a temperature of about 65° C. to about 110° C. for a sufficient length of time to extract bitumens from said solids into said aqueous solution;

removing water from said aqueous solution by flash drying a slurry effluent from said extraction zone to dry said carbonaceous solids, while simultaneously redepositing said extracted bitumens onto said carbonaceous solids and impregnating said carbonaceous solids with said catalyst; and

gasifying said carbonaceous solids at an elevated pressure and temperature in a fluidized gasification zone, wherein the density of the fluidized bed in said gasification zone is maintained at a value above about 160 kg/m^3.

4,604,106

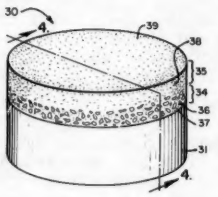
COMPOSITE POLYCRYSTALLINE DIAMOND COMPACT

David R. Hall, Provo, Utah, assignor to Smith International Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 600,399, Apr. 16, 1984, Pat. No. 4,525,178. This application Apr. 29, 1985, Ser. No. 728,177

Int. Cl.[4] B24D *7/14*

U.S. Cl. 51—293 **24 Claims**



1. A composite polycrystalline body for engaging a work material comprising:

a first layer with at least one exposed surface adapted for contacting the work material, said first layer comprising diamond crystals pressed under sufficient heat and pressure to create polycrystalline diamond material in which adjacent diamond crystals are bonded together; and

a second layer which is joined at an interface with the first layer and comprising a mixture of diamond crystals and precemented carbide pieces pressed under sufficient heat and pressure to create composite polycrystalline material in which adjacent diamond crystals are bonded together to create polycrystalline diamond material which is bonded to the precemented carbide pieces, and in which second layer the polycrystalline diamond material and the precemented carbide pieces are interspersed in one another.

4,604,107

LOW TEMPERATURE SEPARATION OF FLUIDS BY FORMATION OF PHASES HAVING DIFFERENT DENSITIES

Peter S. Burr, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 669,974

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340631

Int. Cl.[4] B01D *5/00*

U.S. Cl. 55—17 **14 Claims**

1. A process for the separation of a homogeneous, sour gas-containing fluid mixture comprising:

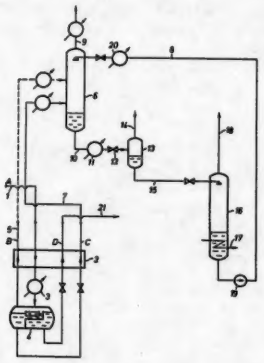
cooling the homogeneous mixture to an effective temperature sufficient to obtain:

(a) a first phase reduced in sour gas and having a low density,

(b) a second phase enriched in sour gas and having a higher density than the first phase,

(c) a third phase containing sour gas and having a higher density than the first and second phases; at least two of the aforementioned phases being liquid phases in equilibrium;

separating the phases (a), (b) and (c) in correspondence with their densities;



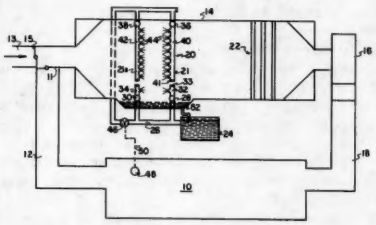
further subjecting at least one of phases (a), (b) and (c) for further separation and/or purification processes.

4,604,108

AIR WASHER AND METHOD

Worth B. Cotton, Jr., Greensboro, N.C., assignor to Industrial Air, Inc., Greensboro, N.C.

Filed Nov. 30, 1981, Ser. No. 325,703
Int. Cl.⁴ B01D *3/04*
U.S. Cl. 55—20 **5 Claims**



1. A spray washer apparatus of the type placed in the return air stream which is moving from a served work area to an air treatment area, of which the spray washer forms a part thereof, before being returned to the work area, said apparatus comprising:

(a) a chilled water source;

(b) at least one bank of spray nozzles connected to said water source, said nozzles receiving chilled water from said source and atomizing said water into said return air stream;

(c) said bank of nozzles being divided into a first upper set of nozzles, and a second lower set of nozzles;

(d) means for dividing the water from said water source into two paths, a first path being directed to said upper set of nozzles and a second path being directed to said lower set of nozzles; and a temperature sensing device in the work area;

(e) a throttling valve positioned in the path between said source of chilled water and said upper set of nozzles for automatically reducing water pressure to said upper set of said nozzles responsive to said temperature sensing device, the water pressure to said upper set being reduced without affecting the water pressure provided to said lower set of nozzles;

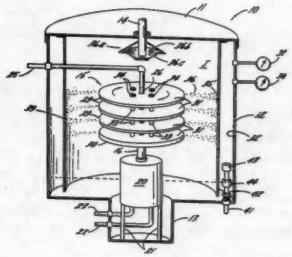
(f) whereby said upper set of nozzles may be throttled or closed during minimum spray conditions while simultaneously delivering water to said lower nozzles at sufficient pressure to atomize the water into said air stream.

4,604,109

FLUID PURIFIER

Evan E. Koslow, Westport, Conn., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 538,229, Oct. 3, 1983, abandoned. This application Nov. 20, 1984, Ser. No. 673,490
Int. Cl.⁴ B01D *19/02*
U.S. Cl. 55—52 **17 Claims**



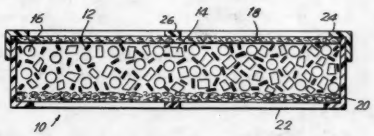
1. A device for separating a substantial fraction of a volatile contaminant from a contaminated fluid, said device comprising a vacuum chamber, the internal space of which may be at least partially evacuated; means for dispersing the contaminated fluid into small droplets including at least one rotating plate disposed within the vacuum chamber and having a continuous surface and means for introducing the contaminated fluid onto the surface of the plate, said introducing means including means disposed generally concentrically with respect to the plate for directing a flow of fluid onto the surface of the plate; and wall means spaced from the rotating plate against which the small droplets impinge and merge to form a purified fluid, the distance between the edge of the rotating plate and the wall menas yielding a sufficient droplet residence time to permit a fraction of a volatile contaminant to be separated from the contaminated fluid as the droplets travel between the edge of the rotating plate and the wall means.

4,604,110

FILTER ELEMENT, FILTER, AND METHOD FOR REMOVING ODORS FROM INDOOR AIR

Stephen E. Frazier, Orlando, Fla., assignor to General Time Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 601,946, Apr. 19, 1984, Pat. No. 4,534,775, which is a continuation of Ser. No. 354,030, Mar. 2, 1982, abandoned. This application Feb. 28, 1985, Ser. No. 707,119
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—74 **42 Claims**



1. An air filter element for removing odors from indoor air consisting essentially of a single layer of a dry mixture of silica gel, activated carbon and a zeolite.

19. An air filter element for removing odors from indoor air consisting essentially of:

a. a first layer of silica gel impregnated with a liquid for inhibiting the growth of microorganisms, said liquid comprising the product obtained by contacting grapefruit pulp with a non-toxic polyhydric alcohol to form a reaction product, and separating said reaction product from said pulp residue, said liquid being present in an amount from about 5 to 50% by weight of the combined weight of said silica gel and said liquid; and

b. a dry second layer of zeolite, active carbon, silica gel or mixtures thereof.

4,604,111

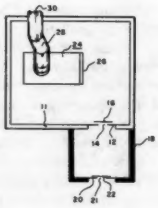
PARTICULATE CONTAMINATION CONTROL METHOD AND FILTRATION DEVICE

Anthony Natale, 450 S. Fork Landing Rd., Maple Shade, N.J. 08052

Continuation of Ser. No. 323,730, Nov. 23, 1981, abandoned. This application May 20, 1985, Ser. No. 735,716

Int. Cl.[4] B01D *46/42*

U.S. Cl. 55—97 **17 Claims**



1. A method of establishing a negative pressure environment within an existing building for removing dangerous solid materials from the building, said method comprising:

(1) defining an enclosed space within said building using existing wall structure to define at least a portion of said enclosed space;

(2) establishing at least one flow path for air to enter said enclosed space;

(3) continuously evacuating air from said enclosed space through a filter means to remove dangerous solid materials from said evacuated air and to establish a negative air pressure in said enclosed space so that air exiting said space passes through said filter means; and

(4) sealing said flow path against air exiting from said air space to the exterior of said enclosed space in the event of loss of negative air pressure in said enclosed space.

8. A system for establishing a favorable environment for removing dangerous solid materials, said system comprising:

wall means enclosing a defined air space within a building, said wall means including at least one inlet for air to enter said air space and an outlet for air to exit from said air space;

filter means for filtering air in said air space;

air moving means for producing a negative air pressure within said air space and for drawing air into said space through said inlet and for moving air through said filter means in advance of moving air through said outlet; and

sealing means for sealing said inlet against air exiting from said air space to the exterior of said air space in the event of loss of negative air pressure in said air space.

4,604,112

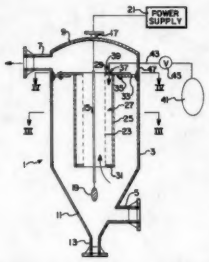
ELECTROSTATIC PRECIPITATOR WITH READILY CLEANABLE COLLECTING ELECTRODE

David F. Ciliberti, Murrysville Boro, and Thomas E. Lippert, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1984, Ser. No. 657,920

Int. Cl.[4] B03C *3/80*

U.S. Cl. 55—117 **10 Claims**



1. In an electrostatic precipitator having a housing for the flow of gases containing particulate matter therethrough, at least one discharge electrode and at least one collecting electrode positioned in a spaced relationship to the discharge electrode to effect a corona discharge therebetween, and a feed line to said housing and discharge line from the housing to effect passage of said flow of gases through said housing between said discharge electrode and collecting electrode, to cause migration of particulate matter in said gas towards the collecting electrode for collection on the collecting surface of the collecting electrode facing the discharge electrode, the improvement wherein:

said discharge electrode is a wire electrode;

said collecting electrode is a coaxial tubular porous electrode surrounding said wire electrode;

means are provided to effect a flow of gas through the porous collecting electrode from the side of the collecting electrode opposite said collecting side to dislodge collected solids therefrom, comprising an impervious tube surrounding said collecting electrode to form an annular chamber therebetween;

means are provided for sealing the chamber at the ends of said coaxial tubes; and

means are provided for injecting a pressurized flow of gas into said annular chamber for passage through said porous collecting electrode.

4,604,113

DEODORIZING APPARATUS

Saburo Takano, Tokyo, Japan, assignor to Kabushiki Kaisha Sanai Estate, Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 545,854

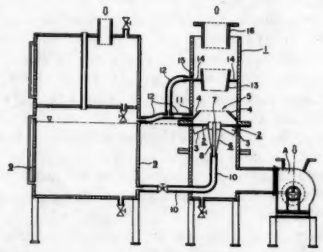
Claims priority, application Japan, Oct. 27, 1982, 57-188128

Int. Cl.[4] B01D *54/14*

U.S. Cl. 55—201 **9 Claims**

1. A deodorizing apparatus, comprising a hollow cylindrical body, a deodorizing-swirling section comprising a swirl-forming plate which is transversely arranged inside of the hollow cylindrical body and is equipped with a plurality of fixed blades each being spaced from one another and radially and obliquely arranged, and a frusto-conical swirl-receiving member provided adjacent to the swirl-forming plate inside of the hollow cylindrical body and having a discharge opening in a side thereof remote from a side thereof adjacent the swirl-forming plate, a deodorizing liquid supply means having one open end opening at a central portion of the swirl-forming plate into the deodorizing-swirling section, a deodorizing liquid tank to which is connected an opposite end of the de-

odorizing liquid supply means, and means for forcibly feeding a gas to be deodorized into the deodorizing-swirling section in an axial direction of the hollow cylindrical body, such that the fed gas is swirled by the action of the radially and obliquely arranged blades, and the deodorizing liquid is fed through said



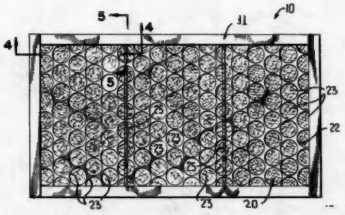
open end of the deodorizing liquid supply means from the deodorizing liquid tank by a sucking action of the swirled gas, thereby bringing the deodorizing liquid into contact with the gas to be deodorized and performing the deodorization of the gas.

4,604,114

FRAGRANT SCENTED AIR FILTER

Robert Ward, P.O.Box 1076, Stephenville, Tex. 76401

Filed Aug. 14, 1985, Ser. No. 765,443
Int. Cl.[4] B01D *39/02*
U.S. Cl. 55—279 **13 Claims**



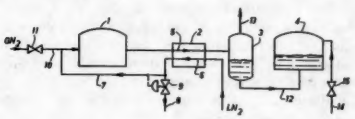
1. A fragrant scented air filter particularly adapted for use in conjunction with interior building heating/air conditioning systems comprising a generally polygonal frame of a U-shaped inwardly opening cross section, a pad of air permeable/porous fibrous filtering material having a polygonal peripheral edge portion bordered by said frame, said frame including a bight and a pair of opposite legs, means sandwiched between said pad and one of said legs for providing generally planar support of said pad against deflection/defibrillation thereof under the influence of air flow through said filter, and at least two solid rods of fragrant scented material spanning said frame in embedded relationship to said pad and in spaced relationship to each other whereby air can freely pass the same with minimum velocity reduction and maximum fragrance absorption.

4,604,115

METHOD AND INSTALLATION FOR TREATING A STORAGE SITE

Michel Bonneton, Grenoble, and Bernard Marchal, Echirolles, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Mar. 19, 1985, Ser. No. 713,627
Claims priority, application France, Mar. 23, 1984, 84 04536
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—11 **17 Claims**



1. A method for treating a storage site, and in particular for purging and rendering inert a tank, comprising minimizing the loss of time and maximizing the recovery of a gaseous product, otherwise resulting from conventional purging, by expelling a said gaseous product contained in said site by injecting nitrogen therein, effecting an indirect heat exchange between the gas issuing from said site and liquid nitrogen so as to partly condense said gas, and injecting into said site gaseous nitrogen resulting from said vaporization of liquid nitrogen.

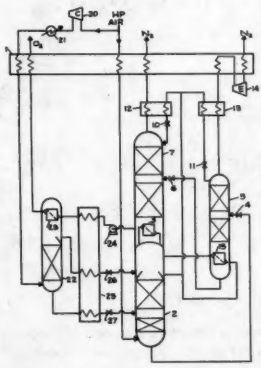
9. An installation comprising: means for treating a storage site, and in particular for purging and rendering inert a tank, sufficient to minimize the loss of time and to maximize the recovery of a gaseous product, otherwise resulting from conventional purging, including a phase separator; a storage vessel communicating with the phase separator; and an indirect heat exchanger comprising first passageways for connection on the upstream side of the heat exchanger to said site and connection on the downstream side of the heat exchanger to the separator, and second passageways connected on the upstream side of the heat exchanger to a source of liquid nitrogen and for connection on the downstream side of the heat exchanger to said site.

4,604,116

HIGH PRESSURE OXYGEN PUMPED LOX RECTIFIER

Donald C. Erickson, 627 Ridgely Ave., Annapolis, Md. 21401

Continuation-in-part of Ser. No. 416,980, Sep. 13, 1982, Pat. No. 4,433,989. This application Feb. 27, 1984, Ser. No. 583,817
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—13 **15 Claims**



1. A cryogenic distillation process for producing oxygen comprising:

(a) withdrawing gaseous oxygen at a product pressure of up to about 10 ATA from a latent heat exchanger;
(b) supplying a fraction of air that has been cleaned and cooled to near its dewpoint at an elevated pressure that is at least approximately 2½ times the oxygen product pressure to an elevated pressure rectification column;
(c) rectifying the elevated pressure air to a liquid N_2 overhead product and an oxygen enriched liquid bottom product;
(d) refluxing the elevated pressure rectifier by indirect heat exchange in said latent heat exchanger with boiling pressurized liquid oxygen, whereby said gaseous oxygen at product pressure is obtained;
(e) supplying said liquid nitrogen, said oxygen enriched liquid, plus a remaining fraction of air at a high pressure that is at least 2 ATA lower than said elevated pressure to a cryogenic distillation apparatus;
(f) distilling said fluids from step (e) so as to obtain low pressure liquid oxygen;
(g) pressurizing said low pressure liquid oxygen for use in step (d), while precluding the requirement for a mechanical gaseous oxygen compressor.

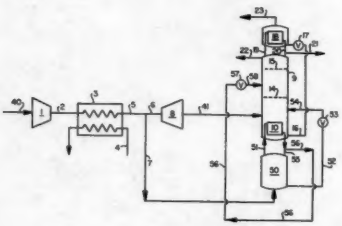
10. An apparatus for producing pressurized gaseous oxygen comprising:
(a) a means designed for providing split supply pressure air, one fraction at a high pressure, and the remaining fraction at an elevated pressure which is at least 2 ATA higher than said high pressure;
(b) an elevated pressure rectifier which rectifies the elevated pressure air fraction to liquid N_2 and oxygen enriched liquid;
(c) a means for pressurizing liquid oxygen;
(d) a reflux condenser for the elevated pressure rectifier which gasifies the pressurized liquid oxygen;
(e) a cryogenic distillation apparatus which is supplied the high pressure air fraction and the liquid N_2 and oxygen enriched liquid from the elevated pressure rectifier and which produces the liquid oxygen which is pressurized in the means for pressurization;
(f) a means designed for withdrawing said gasified pressurized liquid oxygen at a product pressure of up to about 10 ATA, said means including means for precluding a mechanical gaseous oxygen compressor.

4,604,117

HYBRID NITROGEN GENERATOR WITH AUXILIARY COLUMN DRIVE

Harry Cheung, Kenmore, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 15, 1984, Ser. No. 671,940
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—25 **15 Claims**



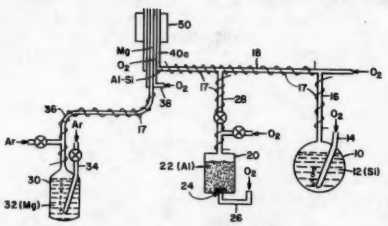
1. A process for the production of nitrogen at relatively high yield and purity by cryogenic rectification of feed air comprising avoiding the need to employ a full scale double column by the steps of:
(a) introducing the major portion of the feed air into a main rectification column which is operating at a pressure in the range of from 35 to 145 psia, and wherein feed is separated into nitrogen-rich vapor and oxygen-enriched liquid;
(b) introducing a minor portion of the feed air into a prefractionation zone at a pressure greater than that at which the main column is operating, and wherein the minor portion is separated into a nitrogen-enriched vapor fraction and an oxygen-enriched liquid fraction;
(c) condensing at least some of the nitrogen-enriched vapor fraction by indirect heat exchange with the oxygen-enriched liquid produced in the main column;
(d) introducing at least some of the resulting condensed nitrogen-enriched fraction, as reflux liquid and additional feed, into the main column at a point at least one tray above the point where the major portion of the feed air is introduced into the main column;
(e) condensing a first portion of the nitrogen-rich vapor by indirect heat exchange with vaporizing oxygen-enriched liquid;
(f) passing at least some o the resulting condensed nitrogen-rich first portion to the main column at a point at least one tray above the point where the condensed nitrogen-enriched fraction is introduced into the main column; and
(g) recovering a second portion of the nitrogen-rich vapor as product nitrogen.

4,604,118

METHOD FOR SYNTHESIZING MGO—AL_2O_3—SIO_2 GLASSES AND CERAMICS

Peter L. Bocko, Painted Post; William J. Wein, Corning, and Charles E. Young, Watkins Glen, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 13, 1985, Ser. No. 765,199
Int. Cl.[4] C03B *37/07*
U.S. Cl. 65—3.12 **8 Claims**



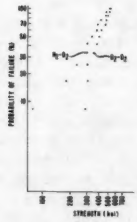
1. A method for synthesizing a vapor deposited MgO—Al_2O_3—SiO_2 oxide product which comprises the steps of:
(a) generating and supplying to a flame oxidation burner vapors of each of $SiCl_4$, an aluminum halide, and a magnesium organometallic compound, the aluminum halide vapors and magnesium organometallic vapors being supplied in separate vapor streams;
(b) injecting the vapors into an oxidizing combustion flame supported by the burner, the aluminum halide and organometallic magnesium vapors being expelled from the burners into the flame in separate vapor streams, and an interposing shield gas stream, free of both aluminum halide and magnesium organometallic vapors, being expelled into the flame between the streams containing the aluminum halide and magnesium organometallic vapors; and
(c) collecting the MgO—Al_2O_3—SiO_2 particulate oxidation product resulting from combustion of the vapors by the flame.

4,604,119

METHOD FOR FUSION SPLICING OPTICAL FIBER

Jane F. Kuhl, Atlanta, and William A. Vicory, Duluth, both of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 24, 1984, Ser. No. 573,142
Int. Cl.[4] C03B *23/20*
U.S. Cl. 65—4.21 7 Claims



1. Method for producing a composite optical fiber by end-to-end fusing a first optical fiber to a second optical fiber, the method comprising

(a) aligning an end of the first optical fiber with an end of the second optical fiber,

(b) heating the aligned fiber ends to a fusion temperature by exposing the aligned fiber ends to a flame produced by combustion of a gas mixture comprising at least one species of oxidizing gas and at least one species of reducing gas, with at least 10% by volume of the total amount of reducing gas present in the mixture being deuterium, and

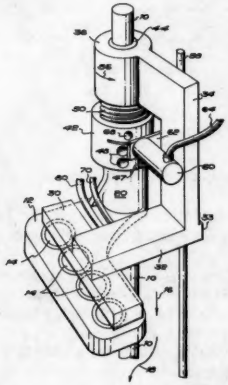
(c) fusing the aligned fiber ends.

4,604,120

METHOD AND APPARATUS FOR LUBRICATING AND MOULDING GLASS PARISONS

Roy Brown, Dronfield, England, assignor to Graphoidal Developments Limited, Dronfield, England

Filed Dec. 21, 1984, Ser. No. 684,920
Claims priority, application United Kingdom, Dec. 23, 1983, 8334407
Int. Cl.[4] C03B *40/02*
U.S. Cl. 65—26 12 Claims



10. A method of moulding glass parisons in blank moulds of a glass forming machine of a type comprising closable blank moulds defining at least one mould cavity, and at least one arm system comprising an arm and an operating shaft fast with said arm for moving said arm to an operative position over the closed blank moulds; said method comprising fitting said machine with apparatus comprising:

a carrier structure with inlet means for lubricant, spray outlet means for discharging lubricant spray onto said blank moulds and duct means connecting said inlet means with said spray outlet means;

supporting means for supporting said carrier structure on said glass forming machine so that said carrier structure is movable between at least one inoperative position and a discharge position over the closed position of said blank moulds for spraying lubricant from said spray outlet means into said at least one mould cavity;

coupling means selectively operable to couple said carrier structure to said arm system whereby, as said arm system moves said arm to the operative position thereof, said arm system also moves said carrier structure from said inoperative position into said discharge position for spraying lubricant;

said coupling means alternatively operating to uncouple said carrier structure from said arm system whereby, as said arm system moves said arm to the operative position thereof, said arm system moves without said carrier structure, and leaves said carrier structure in a said inoperative position thereof;

repeatedly and regularly performing a moulding cycle which includes dropping a gob of molten glass into the cavity, closing the cavity, blowing in air to form the parison, opening the blank moulds and carrying away the parison; during which cycles said carrier structure is uncoupled from said arm system, and said arm system moves without said carrier structure, leaving said carrier structure in a said inoperative position thereof;

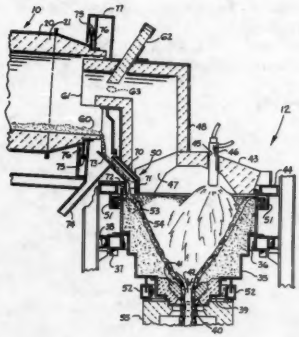
periodically performing a lubrication cycle which comprises the steps of operating said coupling means to couple said carrier structure to said arm system, operating said arm system to move said carrier structure and spray outlets with said arm to a position over the closed blank moulds, spraying lubricant into said at least one mould cavity from said spray outlets, and returning said spray outlets and carrier structure to a said inoperative position.

4,604,121

METHOD OF PRETREATING GLASS BATCH

Henry M. Demarest, Jr., Natrona Heights; Joseph M. Matesa, Plum Boro, and Gerald E. Kunkle, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 519,950, Aug. 3, 1983, abandoned. This application Jul. 2, 1985, Ser. No. 750,989
Int. Cl.[4] C03B *5/10*
U.S. Cl. 65—27 9 Claims



1. A method of melting glass comprising: continuously feeding glass batch material constituting substantially the entire

pulverulent portion of the glass batch to a pretreating vessel, passing a substantially nitrogen-free gas through the pretreating vessel, agitating the batch materials in the pretreating vessel so as to contact the material with the gas being passed through the pretreating vessel and to purge entrapped nitrogen from the materials, and continuously passing the treated materials while being maintained substantially nitrogen-free to a liquefying vessel where the batch materials are liquefied by means of a heat source that does not introduce substantial amounts of nitrogen into the vessel.

4,604,122

METHOD OF SENSING GOBS OF MOLTEN GLASS

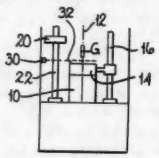
René Keller, Zurich, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 25, 1985, Ser. No. 780,058

Claims priority, application United Kingdom, Sep. 28, 1984, 8424614

Int. Cl.⁴ C03B *5/24*

U.S. Cl. 65—29 **6 Claims**



1. A method of sensing gobs of molten glass as they pass along a path which leads to a mould arrangement of a glassware forming machine, the method comprising transmitting ultrasonic radiation towards a point on the path so that, when the radiation arrives at the point while a gob is occupying the point, the radiation is reflected by the gob towards a detector which detects the reflected radiation, comparing one or more parameters of the radiation detected by the detector with an equal number of expected parameters for radiation which has been reflected by a gob at said point on the path, and producing a signal indicating the presence of a gob if the or each parameter is consistent with its equivalent expected parameter.

4,604,123

PROCESS AND INSTALLATION FOR HEATING A CHANNEL CONTAINING GLASS BY MEANS OF OXYFUEL FLAMES

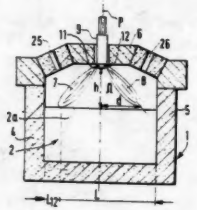
Marc Desprez, Courbevoie, and Serge Laurenceau, Versailles, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jul. 3, 1985, Ser. No. 752,157

Claims priority, application France, Jul. 4, 1984, 84 10597

Int. Cl.⁴ C03B *5/225*

U.S. Cl. 65—134 **7 Claims**



1. A process for heating a vaulted channel in which flows a stream of molten glass in the direction of at least one forming machine, comprising heating longitudinal marginal zones of an upper surface of the stream of glass by means of curtains of flames which issue from oxyfuel burners and are directed from approximately the middle of the vaulted channel towards said marginal zones, and maintaining the direction of all of the flames within the channel away from the channel vault to thereby prevent the direct heating of said vault by said flames, said flames terminating at the point of impact with the glass.

5. An installation for heating a channel in which flows a stream of molten glass in the direction of at least one forming machine, said channel comprising a vault, at least one group of oxyfuel burners carried by said vault and connected to a source of oxygen and to a source of fuel gas, said burners being oriented in such manner as to produce curtains of flames directed from approximately the middle of the vaulted channel towards longitudinal marginal zones of an upper surface of the stream of molten glass, said flames terminating at a point of impact with the glass, and means defining at least one opening associated with each curtain of flames, said opening having such dimensions that an overpressure of gas of a few millimeters of water is maintained above the molten glass so as to avoid entry of air.

4,604,124

APPARATUS FOR MANUFACTURING OF TEMPERED, BENT GLASS SHEETS

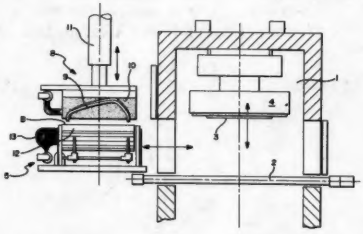
Gottfried Strauss, Heiligenhaus, Fed. Rep. of Germany, assignor to Glasstemp of Toledo, Inc., Perrysburg, Ohio

Filed Feb. 26, 1985, Ser. No. 705,915

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407173

Int. Cl.⁴ C03B *23/03*

U.S. Cl. 65—273 **5 Claims**



1. Apparatus for manufacturing tempered, bent glass sheets, comprising:

(a) a horizontal continuous conveyor for transporting a planar glass sheet into a heating device for softening the glass sheet;

(b) a vacuum lifting device for lifting the softened glass sheet from the conveyor within the heating device;

(c) a bending device, having adjustable bending supports, said bending device being movable in a horizontal direction into the heating device beneath the lifted glass sheet,

(d) a bending die located outside the heating device and movable vertically for positioning above the bending device after the bending device carries the softened glass sheet out of the heating device; and

(e) coolant segments in the bending device as well as in the bending die for cooling the bent glass sheet, said coolant segments being connectable to a fluid supply pipe to introduce cooling fluid into the cooling segments.

4,604,125

SOLID COMPOSITION OF ORGANIC FERTILIZER AND OF ORGANO-MINERAL FERTILIZER

Andrea Robertiello, Rome, and Leonello Angelini, Monterotondo, both of Italy, assignors to Eni-Ente Nazionale Idrocarburi, Rome, Italy

Filed Jun. 11, 1984, Ser. No. 619,038
Claims priority, application Italy, Jun. 15, 1983, 21633 A/83
Int. Cl.[4] C05F *5/00*
U.S. Cl. 71—26 2 Claims

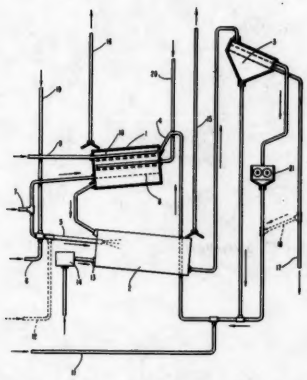
1. A solid composition of organic fertilizer, comprising the solid product obtained from the desalting of a vinasse, said desalting having been conducted by contacting the vinasse having a solids content of 45 to 65% by weight with an acid consisting of phosphoric acid having a specific gravity from 1.50 to 1.69 kg/l in an amount from 2.7 to 3.4 kg per kilogram of potassium in the vinasse, in an organic solvent consisting essentially of ethanol, the ethanol being present in an amount from 10 to 25 parts by volume per 100 parts by volume of the vinasse, said solid product containing a quantity of organic nitrogen of at least 1.5% by weight, a quantity of phosphorous expressed as P_2O_5 of at least 4% by weight, a quantity of potassium expressed as K_2O of at least 5% by weight, and a quantity of organic carbon of at least 8% by weight.

4,604,126

NP/NPK FERTILIZER GRANULES COMPRISED OF AMMONIUM PHOSPHATE

Philippe Moraillon, Saint-Germain-en-Laye, France, assignor to Generale des Engrais S.A., Neuilly-sur-Seine, France

Filed Apr. 28, 1981, Ser. No. 258,460
Claims priority, application France, May 5, 1980, 80 09952
Int. Cl.[4] C05B *7/00*
U.S. Cl. 71—34 39 Claims



1. A continuous process for the production of solid particulates comprising ammonium phosphate, said process comprising: introducing recycled dried product and liquid and solid feedstocks into a mixing zone; passing the resulting mixtures into a drying zone through which passes a flow of gas; simultaneously introducing an acidic liquid and an ammoniacal fluid into a confined and elongate reaction zone to partially neutralize said acidic liquid by said ammoniacal fluid and to produce a jet of reaction mixture comprising slurry and water vapor, said confined and elongate reaction zone being arranged and constructed so as to directly openly communicate into said drying zone so as to project said reaction mixture comprising slurry and water vapor onto the wet solid product which emanates from said mixing zone and to simultaneously dry the product resulting therefrom; and then collecting the resulting dry product at the outlet of the drying zone.

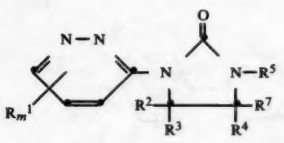
4,604,127

HERBICIDAL PYRIDAZINYLIMIDAZOLIDINONE COMPOUNDS

Riaz F. Abdulla, Greenfield, and Jack G. Samaritoni, Knightstown, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 631,655, Jul. 17, 1984, abandoned. This application May 15, 1985, Ser. No. 734,365
Int. Cl.[4] A01N *43/58;* C07D *237/20, 237/22, 237/12*
U.S. Cl. 71—66 39 Claims

1. A compound of the formula (I):



(I)

wherein

each R^1 independently is halo, C_1–C_8 alkyl, C_1–C_6 alkoxy, C_2–C_6 alkenyl, C_2–C_6 alkynyl, C_3–C_6 cycloalkyl, (C_1–C_3 alkyl)C_3–C_6 cycloalkyl, (C_1–C_3 alkoxy)C_1–C_8 alkyl, adamantyl, phenyl, halo-substituted phenyl, (phenyl)C_1–C_8 alkyl, phenoxy, or (phenoxy)C_1–C_8 alkyl;

R^2 is hydrogen, hydroxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, or

wherein R^6 is C_1–C_{15} alkyl, C_2–C_{15} alkenyl, C_2–C_{15} alkynyl, C_3–C_6 cycloalkyl, di(C_1–C_6 alkyl)amino, di(phenyl-)amino, naphthyl, (C_1–C_6 alkyl)(phenyl)amino, or

wherein each R^8 independently is halo, C_1–C_6 alkyl, C_1–C_6 alkoxy, halo(C_1–C_6 alkyl), cyano, nitro, acetyl, phenyl, benzoyl, phenoxy, phenylthio, (C_1–C_6 alkyl)thio, CF_3O, CF_3S, or carboxy, optionally esterified with C_1–C_6 alkanol;

R^3 is hydrogen or C_1–C_6 alkyl;

R^4 is hydrogen, hydroxy, C_1–C_6 alkyl, or

or R^3 and R^4 together form a double bond;

R^5 is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, or benzyl;

R^7 is hydrogen or C_1–C_6 alkyl; and m and n are independently integers from 0 to 3.

13. A method of inhibiting the growth of unwanted vegetation which comprises contacting the vegetation or the soil in which the vegetation is growing with a herbicidally-effective amount of a compound of claim 1.

38. A method of inhibiting the growth of unwanted aquatic vegetation which comprises contacting the vegetation or the water in which the vegetation is growing with a herbicidally-effective amount of a compound of claim 1.

4,604,128
HERBICIDAL CYCLOHEXANE-1,3-DIONE DERIVATIVES

Keith G. Watson, Blackburn North; John D. Wishart, Mordialloc; Graeme J. Farquharson, Carlton; Graham J. Bird, Ascot Vale, and Lindsay E. Cross, Maribyrnong, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

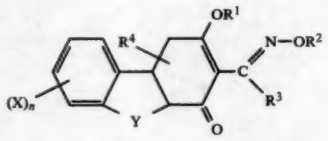
Filed Sep. 10, 1985, Ser. No. 774,525

Claims priority, application Australia, Sep. 25, 1984, PG7297

Int. Cl.[4] **C07D** *335/04, 221/12, 311/80;* **A01N** *43/00, 43/40, 33/08;* **C07C** *131/00*

U.S. Cl. 71—88 **13 Claims**

1. A compound of formula I,



I

wherein:

Y is a linking group selected from the group consisting of: $—(CH_2)_l—$; $—CH(CH_3)—$; $—C(CH_3)_2—$; $—CH(CH_3)CH_2—$; $—G(CH_2)_m—$; $—CH_2GCH_2—$; $—C(G)(CH_2)_m—$; $—GC(G)—$; and $—NHC(G)—$;

wherein:

G is selected from oxygen and sulfur;

l is an integer selected from 1 to 3; and

m is zero or an integer selected from 1 and 2;

n is zero or an integer selected from 1 to 4;

X, which may be the same or different, are independently selected from the group consisting of: halogen; nitro; cyano; C_1 to C_6 alkyl; C_1 to C_6 alkyl substituted with halogen or cyano; hydroxy; C_1 to C_6 alkoxy; C_1 to C_6 alkylthio; sulfamoyl; N—(C_1 to C_6 alkyl)sulfamoyl; N,N-di(C_1 to C_6 alkyl)-sulfamoyl; the group $—(CH_2)_pC(=A)Z$ wherein p is zero or one, A is selected from oxygen and sulfur, and Z is selected from the group consisting of hydrogen, hydroxy, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, amino, N-(C_1 to C_6 alkyl) amino, N,N-di(C_1 to C_6 alkylamino, N-(C_1 to C_6 alkanoyl)amino, C_1 to C_6 alkyl, and C_1 to C_6 haloalkyl; the group $—NR^5R^6$ wherein R^5 and R^6 are independently selected from the group consisting of hydrogen, C_1 to C_6 alkyl, C_2 to C_6 alkanoyl, C_2 to C_6 haloalkanoyl, C_1 to C_6 alkylsulfonyl, and benzoyl; the group $—NHC(=B)NR^7R^8$ wherein B is selected from oxygen and sulfur and R^7 and R^8 are independently selected from hydrogen and C_1 to C_6 alkyl; and the group $—(CH_2)q—$which bridges two adjacent carbon atoms of the benzene ring and wherein q is an integer selected from 3 or 4;

R^1 is selected from the group consisting of: hydrogen; an acyl group; and an inorganic or organic cation;

R^2 is selected from the group consisting of: C_1 to C_6 alkyl; C_2 to C_6 alkenyl; C_2 to C_6 haloalkenyl; C_2 to C_6 alkynyl; C_3 to C_6 haloalkynyl; and substituted C_1 to C_6 alkyl wherein the alkyl group is substituted with a substituent selected from the group consisting of halogen, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, phenyl and substituted phenyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, and C_1 to C_6 alkylthio;

R^3 is selected from the group consisting of: C_1 to C_6 alkyl; C_1 to C_6 fluoroalkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl; and phenyl; and

R^4 is selected from the group consisting of: hydrogen; halogen; cyano; C_1 to C_6 alkyl; and (C_1 to C_6 alkoxy) carbonyl.

10. A herbicidal composition comprising as active ingredient a herbicidally effective amount of a compound as defined according to claim **1** and an inert carrier therefor.

4,604,129
INFLUENCING PLANT GROWTH

Eberhard P. Schott, Neustadt; Volker Fischer, Wessental; Johann Jung, Limburgerhof, and Henning Rosebrock, Stetten, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 388,516, Jun. 15, 1982, abandoned. This application Aug. 14, 1984, Ser. No. 640,237

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124497

Int. Cl.[4] **A01N** *43/90*

U.S. Cl. 71—76 **5 Claims**

1. A process for reducing the stem length of rice or Indian corn plants, which comprises: soaking the seeds of the plants in a dressing liquid containing an effective amount of a polycyclic, nitrogen-containing compound selected from the group consisting of 5-(4-chlorophenyl)-3,4,5,9,10-pentaazatetracyclo-[5,4,1,$0^{2,6}$,$0^{8,11}$]-dodeca-3,9-diene and 5-(4-bromophenyl)-3,4,5,9,10-pentaazatetracyclo-[5,4,1,$0^{2,6}$,$0^{8,11}$]-dodeca-3,9-diene, and thereafter planting the treated seeds.

4,604,130
HERBICIDAL N-[PYRIMIDINE AMINOCARBONYL]ISOTHIAZOLE SULFONAMIDES

Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 478,146, Mar. 30, 1983, abandoned. This application Aug. 13, 1984, Ser. No. 639,942

Int. Cl.[4] **A01N** *43/02;* **C07D** *401/00, 403/00*

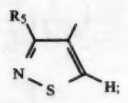
U.S. Cl. 71—90 **21 Claims**

1. A compound of the formula:

$QSO_2NHCONHA$

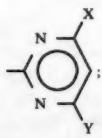
where

Q is



R_5 is Cl, C_1–C_3 alkoxycarbonyl or C_1–C_3 alkyl;

A is



X is CH_3, OCH_3, OCF_2H, CC_2H_5, or CH_2OCH_3; and

Y is CH_3, OCH_3 or OCF_2H;

and agriculturally suitable salts thereof.

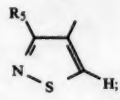
11. A method for controlling the growth of undesired vegetation comprising applying to the locus of such vegetation an agriculturally effective amount of a compound of claim **1**.

16. A compound of the formula:

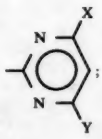
$QSO_2NHCONHA$

where

Q is



R_5 is Cl, C_1–C_3 alkoxycarbonyl or C_{1-3} alkyl;
A is



X is cyclopropyl;
Y is CH_3, OCH_3 or OCF_2H; and
agriculturally suitable salts thereof.

20. A method for controlling the growth of undesired vegetation comprising applying to the locus of such vegetation an agriculturally effective amount of a compound of claim **16**.

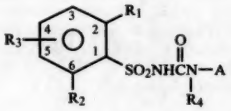
4,604,131

HERBICIDAL SULFONAMIDES

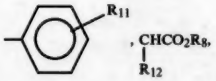
Mary A. Hanagan, Blue Bell, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 520,801, Aug. 5, 1983, abandoned. This application Jul. 12, 1984, Ser. No. 628,259
Int. Cl.[4] **C07D** *251/16, 251/46, 251/18;* **A01N** *43/70*
U.S. Cl. 71—90 **27 Claims**

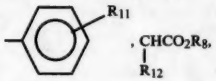
1. A compound of the formula:



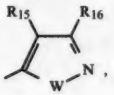
wherein
R_1 is $S(O)_nR_5$, CF_3, NR_6R_7, CO_2R_8, $SO_2NR_9R_{10}$,

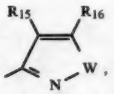


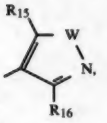
OSO_2R_{13}, CH_2OR_{14} or Q;
R_2 is $S(O)_mR_5$, CF_3, NR_6R_7, CO_2R_8, $SO_2NR_9R_{10}$,



OSO_2R_{13}, CH_2OR_{14} or Q;
R_3 is H, Cl, F, Br, CH_3, OCH_3 or CF_3;
R_4 is H or CH_3;
R_5 is C_1–C_3 alkyl;
R_6 and R_7 are independently CH_3 or CH_2CH_3;
R_8 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, CH_2CH_2Cl or $CH_2CH_2OCH_3$;
R_9 is CH_3 or OCH_3;
R_{10} is C_1–C_3 alkyl;
R_{11} is H, Cl, Br, F, CH_3 or OCH_3;
R_{12} is H or CH_3;
R_{13} is C_1–C_3 alkyl or CF_3;
R_{14} is C_1–C_3 alkyl or CF_2H;
n is 0, 1 or 2;
m is 0 or 1;
Q is


Q-1


Q-2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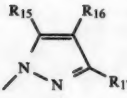
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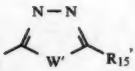
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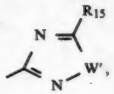
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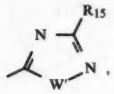
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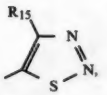
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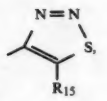
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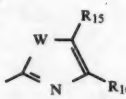
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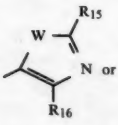
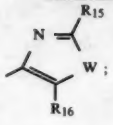
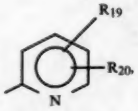
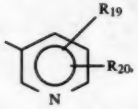

Q-11

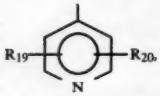
-continued

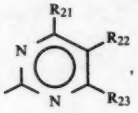
Q-12 

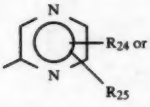
W is O, S or NR_{18};
W' is O or S;
R_{15}, R_{16}, R_{17} and R_{18} are independently H or CH_3;
Q is also

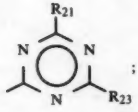
Q-13 

Q-14 

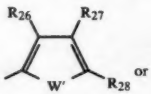
Q-15 

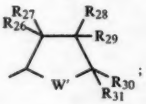
Q-16 

Q-17 

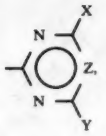
Q-18 

R_{19}, R_{20}, R_{22}, R_{24} and R_{25} are independently H or CH_3;
R_{21} and R_{23} are independently H, CH_3 or OCH_3;
Q is also

Q-19 

Q-20 

R_{26}, R_{27}, R_{28}, R_{29}, R_{30} and R_{31} are independently H or CH_3;
A is

A-1 

Z is N;
X is CH_3, OCH_3, OCH_2CH_3, or OCF_2H;
Y is H, NH_2, $NHCH_3$, $N(CH_3)_2$, CH_3, CH_2CH_3, CF_3, CH_2OCH_3, $CH_2OCH_2CH_3$, $O(C_1$–C_3 alkyl), SCH_3, $O(C_3$–C_4 alkenyl), $O(C_3$–C_4 alkynyl), OCH_2CF_3, OCH_2CH_2F, OCH_2CH_2Cl, OCH_2CH_2Br or OCF_2H;
and agriculturally suitable salts thereof; provided that
(a) when either one of R_1 or R_2 is CF_3, then the other is also CF_3;
(b) R_1 and R_2 are not simultaneously CO_2R_8;
(c) when either one of R_1 or R_2 is $SO_2NR_9R_{10}$, then the other must not be $S(O)_nR_5$, $S(O)_mR_5$, CH_2OR_{14} or NR_6R_7;
(d) when R_9 is OCH_3, then R_{10} is CH_3;
(e) when either one of R_1 or R_2 is CO_2R_8, then the other must not be $S(O)_nR_5$, $S(O)_mR_5$ or NR_6R_7;
(f) the total number of carbon atoms in R_{26} to R_{31} combined is equal to or less than four;
(g) when X or Y is OCF_2H, then R_2 is Q; and
(h) R_1 cannot be CO_2R_8 when R_2 is OSO_2R_{13}.

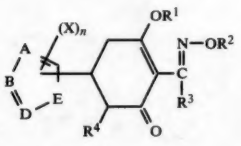
4,604,132

HERBICIDAL 5-(HETERO-SUBSTITUTED) CYCLOHEXANE-1,3-DIONE DERIVATIVES

Richard J. Conway, Essendon; Keith G. Watson, Box Hill North, and Graeme J. Farquharson, Reservoir, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Apr. 27, 1984, Ser. No. 604,967
Claims priority, application Australia, May 6, 1983, PF9198
Int. Cl.[4] **C07D** *277/24, 263/34;* **A01N** *43/00, 43/02*
U.S. Cl. 71—90 **10 Claims**

1. A compound of the formula I

I 

wherein:
A and D are CH and B is N;
E is selected from oxygen and sulfur:
X, which may be the same or different, are independently selected from the group consisting of C_1 to C_6 alkyl, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, halogen, amino, N-(C_1 to C_6 alkyl)amino, N,N-di(C_1 to C_6 alkyl)amino, C_2 to C_6 alkenoyl, phenyl, C_1 to C_6 alkyl substituted with a substituent selected from the group consisting of halogen, nitro, hydroxy, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio, sulfamoyl, N-(C_1 to C_6 alkyl)sulfamoyl and N,N-di(C_1 to C_6 alkyl)-sulfamoyl;
R^1 is selected from the group consisting of: hydrogen; C_2 to C_6 alkanoyl; benzoyl and and the alkali metals, the alkaline earth metals, the transition metals, the ammonium ion and the tri- and tetra-(alkyl)ammonium ions wherein alkyl is selected from C_1 to C_6 alkyl and C_1 to C_6 hydroxyalkyl;
R^2 is selected from the group consisting of: C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_2 to C_6 alkynyl, C_1 to C_6 haloalkyl, C_2 to C_6 haloalkenyl and C_2 to C_6 haloalkynyl;
R^3 is selected from C_1 to C_6 alkyl;

R^4 is selected from hydrogen, halogen and (C_1 to C_6 alkoxy)-carbonyl; and
n is zero or an integer selected from 1 and 2.

4,604,133

HERBICIDAL SULFONAMIDE INNER SALTS

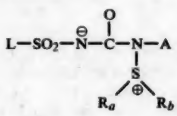
Chi-Ping Tseng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 551,004, Nov. 16, 1983, Pat. No. 4,484,939, which is a continuation-in-part of Ser. No. 467,650, Feb. 18, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,967

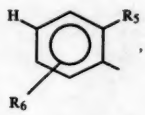
Int. Cl.[4] **C07D** *251/18, 251/52, 251/46;* **A01N** *43/70*

U.S. Cl. 71—90 **14 Claims**

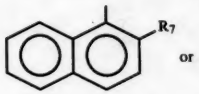
1. A compound of the formula:



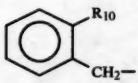
wherein
R_a is CH_3 or CH_2CH_3;
R_b is CH_3 or CH_2CH_3;
L is



L-1

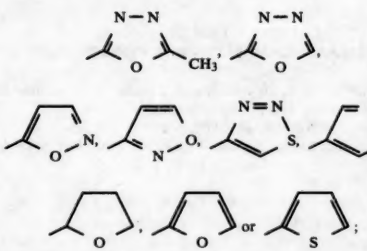


L-2

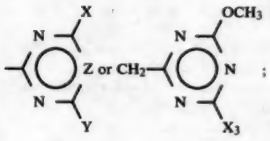


L-7

R_5 is C_1–C_4 alkyl, C_1–C_4 alkoxy, $OCH_2CH_2OCH_3$, F, Cl, Br, NO_2, CF_3, CO_2R_{19}, $SO_2NR_{20}R_{21}$, $SO_2N(OCH_3)CH_3$, OSO_2R_{22}, $S(O)_nR_{23}$, WCF_3, $WCHF_2$, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_1–C_2 alkyl substituted with OCH_3 or OCH_2CH_3, C_6H_5,

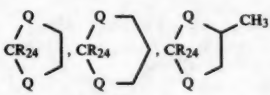


R_6 is H, F, Cl, Br, CF_3, CH_3, OCH_3, SCH_3 or OCF_2H;
R_7 is H, CH_3, OCH_3, F, Cl, Br, OSO_2CH_3 or $S(O)_nCH_3$;
R_{10} is Cl, NO_2, CO_2CH_3, $CO_2CH_2CH_3$, $SO_2N(CH_3)_2$, OSO_2CH_3, SO_2CH_3, $SO_2CH_2CH_3$, OCH_3 or OCH_2CH_3;
R_{19} is C_1–C_4 alkyl, $CH_2CH_2OCH_3$, CH_2CH_2Cl or $CH_2CH{=}CH_2$;
R_{20} is C_1–C_3 alkyl;
R_{21} is C_1–C_3 alkyl;
R_{22} is C_1–C_3 alkyl or $N(CH_3)_2$;
R_{23} is C_1–C_3 alkyl or $CH_2CH{=}CH_2$;
n is 0 or 2; and
W is O, S or SO_2;
A is



A-1 A-6

X is CH_3, OCH_3, OCH_2CH_3, OCF_2H, CH_2F or CF_3;
Y is H, CH_3, OCH_3, OCH_2CH_3, CH_2OCH_3, $CH_2OCH_2CH_3$, $N(CH_3)_2$, CH_2CH_3, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, OCH_2CF_3, $OCH_2CH_2OCH_3$, CH_2SCH_3, OCF_2H, SCF_2H, $CR_{24}(QCH_3)_2$,



or $CR_{24}(QCH_2CH_3)_2$; Q is O or S;
R_{24} is H or CH_3;
Z is N;
X_3 is CH_3 or OCH_3; provided that
the total number of carbon atoms of R_{20} and R_{21} is less than or equal to four.

4,604,134

POLLEN SUPPRESSANT COMPRISING A FUSED PYRIDAZINE

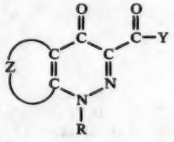
Jeffrey N. Labovitz, Palo Alto, and Lawrence Fang, Daly City, both of Calif., assignors to Lafarge Coppee, Paris, France

Filed Sep. 14, 1983, Ser. No. 532,020

Int. Cl.[4] **A01N** *43/58;* **C07D** *237/28*

U.S. Cl. 71—92 **13 Claims**

10. A pollen-suppressing composition, comprising:
(1) an amount sufficient to suppress pollen production in a wheat plant of at least one compound of



where
Z represents a divalent organic radical of the formula —CH=CH—CH=CH—, or said radical in which an H of Z is replaced with
(a) a halogen atom with the proviso that no more than three H or Z are replaced by fluorine;
(b) a C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkanoyl, cyano, nitro, hydroxy, or trihalomethyl group; or
(c) a group of the formula $—NR^1R^2$ wherein R^1 and R^2 independently represent a hydrogen atom or a C_1–C_4 alkyl group;
Y is Y^1R^3 or NR^4R^5 wherein Y^1 is oxygen or sulfur; R^3 is

hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxyalkyl, cyclohexylmethyl, halogenated C_1–C_4 alkyl, phenyl, or benzyl; and R^4 and R^5 are independently selected from the group consisting of hydrogen, C_1–C_4 alkyl or C_1–C_4 alkyl substituted with carboxyl or C_1–C_4 alkoxycarbonyl; and

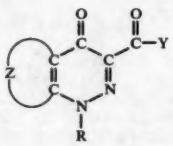
R represents phenyl, naphthyl, or phenyl or naphthyl substituted with one to three substituents selected from the group consisting of halogen, trihalomethyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, and cyano;

or a salt thereof;

(2) in combination with an inert agronomically acceptable carrier.

13. A method of producing hybrid seeds from a self-pollenizing gramineous plant, which comprises:

(1) sterilizing the male anthers of a female parent plant with a compound of the formula



where

Z represents a divalent organic radical of the formula —CH=CH—CH=CH—, or said radical in which an H or Z is replaced with

(a) a halogen atom;

(b) a C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkanoyl, cyano, nitro, hydroxy, or trihalomethyl group; or

(c) a group of the formula NR^1R^2 wherein R^1 and R^2 independently represent a hydrogen atom or a C_1–C_4 alkyl group;

Y is Y^1R^3 or NR^4R^5 wherein Y^1 is oxygen or sulfur; R^3 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxyalkyl, cyclohexylmethyl, halogenated C_1–C_4 alkyl, phenyl, or benzyl; and R^4 and R^5 are independently selected from the group consisting of hydrogen, C_1–C_4 alkyl, or C_1–C_4 alkyl substituted with carboxyl or C_1–C_4 alkoxycarbonyl; and

R represents C_1–C_4 alkyl, phenyl, naphthyl, or phenyl or naphthyl substituted with one to three substituents selected from the group consisting of halogen, trihalomethyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, and cyano;

or a salt thereof; and

(2) pollenating said female parent with pollen from an untreated male parent, thereby producing said hybrid seed.

4,604,135

APPARATUS AND PROCESS FOR THE METALLURGICAL AFTERTREATMENT OF PREMELTED METALS

Karl-Heinz Heinen; Wolfgang Glitscher, and Heinz Zörcher, all of Siegen, Fed. Rep. of Germany, assignors to Krupp Stahl AG, Bochum, Fed. Rep. of Germany

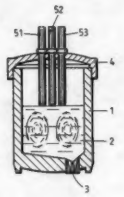
Filed May 29, 1985, Ser. No. 738,918

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 3424510

Int. Cl.[4] C21C *5/52*

U.S. Cl. 373—60 **5 Claims**

1. An apparatus for refining molten steels, after smelting in a separate vessel, comprising: a cylindrical ladle for receiving molten steel, and at least one non-consumable electrode passing through said cover for heating the molten steel via electric arcs, wherein the at least one electrode consists of a continuously cast steel billet having a composition corresponding to



the analysis of the metal melt, the apparatus intended for aftertreatment of premelted metals.

4,604,136

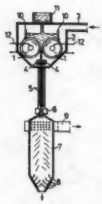
METHOD AND AN APPARATUS FOR SUBDIVISION OF AND HEAT RECOVERY FROM A LIQUID SLAG

Bruno Bergkvist, Täby; Martti Kölhi, Stenhamra; Erik Strandell, Lidingö, and Christer Svemar, Upplands-Väsby, all of Sweden, assignors to AB Svensk Alunskifferutveckling, Stockholm, Sweden

Filed May 30, 1984, Ser. No. 615,879

Int. Cl.[4] F27D *15/02*

U.S. Cl. 75—24 **9 Claims**



1. A method of sub-dividing and recovering heat from a liquid slag comprising:

rolling the liquid slag between at least two cooled briquetting rolls, controlling the temperature of and distance between the rolls so as to obtain a cohesive slag slab with shaped briquettes having a solidified surface layer and a melted central layer, cooling the briquetted slab to a temperature whereat the portions of the shaped slab between the briquettes themselves crack up, whereby the briquettes are automatically separated from each other and recovering heat from the separated briquettes.

4,604,137

METHOD AND APPARATUS FOR CONTROLLED MELT REFINING

Katsuhiko Yamada, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 18, 1985, Ser. No. 777,136

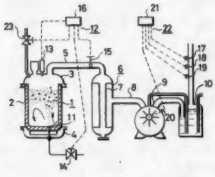
Claims priority, application Japan, Sep. 18, 1984, 59-196191

Int. Cl.[4] C21C *5/52*

U.S. Cl. 75—49 **5 Claims**

1. A method of controlled melt refining comprising: (a) covering the surface of a semi-killed molten steel in a ladle with a basic slag which either is non-oxidizing or contains not more than 5% of FeO; (b) maintaining the pressure of the atmosphere above the melt in the range of 30–150 Torr; (c) blowing an inert gas into the ladle from the bottom; and (d) maintaining the height of the boiling melt in terms of gas holdup ($\Delta H/\bar{H}$) within the range of 0.1–0.5 by controlling the pressure

at which the inert gas is blown and/or by adjusting a vacuum exhaust valve, ΔH being the difference in height between the



surface of the boiling melt and a quiet melt, and H being the height of the quiet melt.

4,604,138

PROCESS FOR REFINING HOT METAL

Erich Höffken; Wolfram Florin, both of Dinslaken, and Rudolf Hammer, Dinslaken-Eppinghoven, all of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Filed Sep. 11, 1985, Ser. No. 774,632

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434894

Int. Cl.[4] C21C *5/34*

U.S. Cl. 75—51.6 3 Claims

1. In the production of steel of low phosphorus content from hot metal having a phosphorus content up to 0.2% by weight, wherein a refining gas comprising oxygen is top-blown onto a steel-producing melt and an inert stirring gas is blown into the melt, the improvement which comprises employing a melt having a manganese content of less than 0.2% by weight, adding lime to the melt and continuing refining down to a final phosphorus content of at most 0.005% by weight in the steel at the end of blowing, without a change of slag, whereby the steel is simultaneously decarburised and dephosphorised.

4,604,139

DUAL COLOR INK COMPOSITION

Keiko Shioi, Daito, and Yukito Shoji, Suita, both of Japan, assignors to Sakura Color Products Corp., Osaka, Japan

Filed Feb. 2, 1982, Ser. No. 344,933

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—23 16 Claims

1. An ink composition for writing on an absorbent or pervious writing surface to provide a writing (composed of an inner portion of a first color with substantial outer contour portions therearound of a second color,) which composition comprises:

a first colorant,

a second colorant and

a vehicle,

said first colorant being dispersed throughout said vehicle and having a particle size sufficiently large so as to substantially not permeate or be absorbed into said writing surface and

said second colorant being a dyestuff dissolved throughout said vehicle, being capable of substantially permeating or being absorbed into said writing surface and diffusing into the area on said surface proximate to said writing,

whereby said second colorant forms said outer contour portions around said inner portion of said first colorant.

4,604,140

FOUNDRY SANDS DERIVED FROM SERPENTINE AND FOUNDRY MOLDS DERIVED THEREFROM

Jean M. Lalancette; Jean P. Chevalier-Bultel, both of Sherbrooke, and Luc Desrosiers, Rock Forest, all of Canada, assignors to Societe Nationale de l'Amiante, Quebec, Canada

Filed Apr. 26, 1984, Ser. No. 604,039

Int. Cl.[4] B23B *7/28*

U.S. Cl. 106—38.9 2 Claims

1. A granular product suitable for use as foundry sands and obtained from asbestos tailings calcined at a temperature of from 1250° to 1450° C., said asbestos tailings having an $MgO:SiO_2$ ratio greater than 1.0, the granules constituting the granular product being characterized by having a thermal expansion at 1000° C. of not more than 1.0% and a particle size of between −20 to +200 mesh (Tyler), the granules being further characterized by being made up mainly of particles of enstatite bonded by gruenerite and fayalite, and substantially unreactive to basic oxides present in the cast metal.

4,604,141

SLIP CASTING MOLD

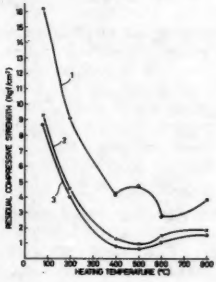
Tatsuo Natori, Kashiwa; Hideo Nakae, Tokyo; Akihide Watanabe, and Takashi Shimaguchi, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,483

Claims priority, application Japan, Apr. 15, 1983, 58-65372; Sep. 14, 1983, 58-168120

Int. Cl.[4] B29C *33/00*

U.S. Cl. 106—38.35 4 Claims



1. A slip casting mold consisting essentially of a gypsum mold, wherein said gypsum mold contains 2 to 20 parts by weight of a water-insoluble and water-absorbing vegetable cellulose and 0.05 to 2.00 parts by weight of impure gelatin, per 100 parts by weight of gypsum, whereby addition of the impure gelatin to the mold containing a water-insoluble and water-absorbing vegetable cellulose raises the initial strength of the mold while improving the collapsing property of the mold after heating at a temperature of at least 400° C.

4,604,142

INVESTMENTS FOR DENTAL CASTING

Hiroshi Kamohara; Shohei Hayashi, both of Tokyo, and Nobukazu Ohi, Fuchu, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 743,159

Claims priority, application Japan, Jul. 6, 1984, 59-138942

Int. Cl.[4] B22C *1/08*

U.S. Cl. 106—38.51 2 Claims

1. An investment material for dental casting, in which 2 to 5 parts by weight of natural starch are added to 100 parts by weight of a mixture of hemihydrate gypsum, quartz and/or cristobalite.

4,604,143
DEMOLITION FACILITATING AGENT

Yuichi Suzukawa; Waichi Kobayashi, and Satoshi Ohtaka, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 533,887, Sep. 20, 1983, abandoned, which is a continuation of Ser. No. 376,238, May 7, 1982, abandoned. This application Apr. 24, 1985, Ser. No. 726,284
Claims priority, application Japan, May 19, 1981, 56-74195
Int. Cl.[4] C04B *7/04*
U.S. Cl. 106—89 **8 Claims**

7. A demolition-facilitating aqueous slurry for durable structures, comprising:

(A) 100 parts by weight of a mixture in the form of fine particles, consisting essentially of

(1) 95 to 99% by weight of a clinker consisting of (a) 78 to 97% by weight of free CaO crystals, (b) 3 to 22% by weight of free $3CaO\ SiO_2$ crystals and (c) 0 to 10% by weight of an impurity, said clinker having been produced at a sintering temperature of at least 1200° C.;

(2) 1 to 5% by weight, of at least one gypsum anhydride ($CaSo_4$);

(B) 0.4 to 4 parts by weight of a cement water-reducing agent; and

(C) sufficient water to form a pourable slurry.

4,604,144
PROCESS FOR CLEANING A CIRCUIT BOARD

Ching-Ping Wong, Lawrence Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Sep. 11, 1985, Ser. No. 774,674
Int. Cl.[4] C23G *1/02, 1/14*
U.S. Cl. 134—28 **10 Claims**

1. A method of cleaning a circuit board subsequent to soldering with a water soluble flux which comprises:

(1) washing the board in an aqueous detergent solution,

(2) rinsing the board with water,

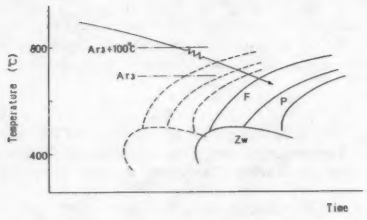
(3) washing the board in an aqueous solution of a low molecular weight mono or dicarboxylic acid, and then

(4) rinsing the board with water.

4,604,145
PROCESS FOR PRODUCTION OF STEEL BAR OR STEEL WIRE HAVING AN IMPROVED SPHEROIDAL STRUCTURE OF CEMENTITE

Susumu Kanabara, and Kenji Aihara, both of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jul. 19, 1984, Ser. No. 632,234
Claims priority, application Japan, Jan. 13, 1984, 59-4614; Jan. 13, 1984, 59-4615; Jan. 24, 1984, 59-9500
Int. Cl.[4] C21D *9/52*
U.S. Cl. 148—12 B **7 Claims**



1. Process for producing a steel bar or steel wire, which comprises:

heating a steel containing less than 2% of C at a temperature higher than the Ac_1 point of the steel;

rough working the heated steel;

finish working the rough-worked steel within a temperature range between Ar_1 and Ar_3 or Arcm with a reduction ratio of at least 20%; and

cooling the finish-worked steel at a cooling rate of lower than 60° C./minute to a temperature lower than 500° C.;

thereby providing a steel bar or steel wire having a spheroidal cememtite structure.

4,604,146
PROCESS FOR MANUFACTURING HIGH TENSILE STEEL WIRE

Akira Aida, Kitakyushu; Tetsu Ohno, Nishinomiya; Takashi Fukuda; Kenji Aihara, both of Kitakyushu; Takuo Mizoguchi, Yukuhashi; Syozi Nishimura, and Katsuyoshi Kajiyama, both of Kitakyushu, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 319,070, Nov. 6, 1981, abandoned. This application Nov. 7, 1983, Ser. No. 563,322
Claims priority, application Japan, Nov. 8, 1980, 55-157276; Sep. 2, 1981, 56-139187
Int. Cl.[4] C21D *9/52*
U.S. Cl. 148—12 B **8 Claims**

1. A Process for manufacturing a high tensile steel wire, characterized by comprising the steps of:

pre-cooling a hot-rolled steel rod to a temperature between 750°–900° C. by means of a cooling apparatus provided between a group of intermediate rolling mills and a group of finishing rolling mills in a hot rolling line for steel rod;

finishing rolling the thus pre-cooled steel rod;

quenching the hot-rolled steel rod to a temperature of 700° C. or lower to provide supercooled austenite;

then finish-cooling the thus quenched rod to provide a martensitic structure;

drawing the resulting steel rod with roller dies without descaling to form a wire; and

warm straightening the resulting steel wire to produce a steel wire having a tensile strength of at least 110 kgf/mm^2.

4,604,147
METHOD OF MANUFACTURING PERMANENT MAGNETS

Helmut Brandis, and Wolfgang Spyra, both of Krefeld, Fed. Rep. of Germany, assignors to Thyssen Edelstahlwerke AG, Krefeld, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,237
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334369
Int. Cl.[4] H01F *1/02*
U.S. Cl. 148—102 **2 Claims**

1. A method of manufacturing a permanent magnet comprising forming a workpiece of an alloy having the following composition by weight:

Chromium	22.5 to 25.5%
Cobalt	15.0 to 17.5%
Molybdenum	2.0 to 4.0%
Silicon	0.1 to 0.8%
Oxygen	less than 0.10%
Effective carbon	less than 0.06%
Remainder	iron and unavoidable impurities,

where effective carbon is defined as carbon content plus 0.86 times nitrogen content,

and subjecting the workpiece to:

(a) a homogenising annealing for 15 minutes to 3 hours at 1230° C. to 1280° C., followed by quenching in liquid; then to

(b) a treatment comprising treating the workpiece for 10 to 30 minutes at 720° C. to 740° C., followed by the application for 10 to 120 minutes in a preferred axial direction of a magnetic field of 80 to 240 kA/m at a temperature of

630° C. to 650° C., followed by cooling in air; and subsequently to

(c) an age-hardening treatment in the following stages:

(ci) maintaining the workpiece at 590° C. to 625° C. for 0.25 to 10 hours

(cii) maintaining the workpiece at 555° C. to 585° C. for 0.5 to 30 hours, and

(ciii) maintaining the workpiece at 500° C. to 540° C. for 0 to 50 hours; thereby to form a permanent magnet which has the following properties, measured in the direction of magnetisation;

coercive field strength $_BH_C$ at least 50 kA/m;

remanence Br at least 1.2 T; and

energy value $(BH)_{max}$ at least 39 kJ/m^3.

4,604,148

METHOD OF INCREASING THE PHASE STABILITY AND THE COMPRESSIVE YIELD STRENGTH OF URANIUM-1 TO 3 WT. % ZIRCONIUM ALLOY

Robert C. Anderson, Crossville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 22, 1983, Ser. No. 554,487

Int. Cl.[4] C21D *1/00*

U.S. Cl. 148—132 **3 Claims**

1. A method for increasing the phase stability and the compressive yield strength of a corrosion resistant uranium-1 to 3 wt. % zirconium alloy comprising the steps of reducing the thickness of a homogeneous ingot of the alloy by upset forging, rolling the forged ingot into a plate, heating the plate in vacuum to a temperature about the gamma transformation temperature and water quenching the plate to ambient temperature with said alloy exhibiting alpha prime and equilibrium alpha plus delta phases, the improvement comprising the steps of cold rolling the plate after said quenching to further reduce the thickness of the plate, aging the cold rolled plate at a first temperature, thereafter aging the cold rolled plate at a second temperature higher than said first temperature for converting alpha prime phase into additional equilibrium alpha and delta phases, and cooling said plate to ambient temperatures.

4,604,149

PROCESS FOR HARDENING ELONGATE METAL ELEMENTS

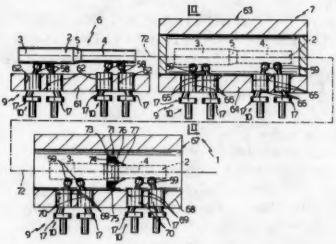
Vanfrido Olivotto, Turin, Italy, assignor to Olivotto S.p.A., Turin, Italy

Filed Mar. 22, 1985, Ser. No. 714,937

Claims priority, application Italy, Apr. 20, 1984, 67405 A/84

Int. Cl.[4] C21D *1/00*

U.S. Cl. 148—153 **12 Claims**



1. A process for hardening elongated metal elements, in particular both solid and tubular rectilinear circular section bars, having constant or variable section, and of extended length, characterized by the fact that it comprises the steps of:

positioning each said element (2) to be hardened on a conveyer device (9) extending through a heating station (7) and a hardening, cooling station (8), and comprising a succession of rotatable support and advance means (17) individually adjustable in position and direction substantially transverse to said element (2), and individually operable in a controllable manner to impart to each point of said element (2) displacements having a controllable velocity along a respective cylindrical helix maintained, by means of said control of said rotatable support and advancement means in a direction transverse to said element, always substantially coaxial with an axis of advancement (72) of the element (2) along said conveyer device (9), the pitch of said helix being adjustable from point to point of said conveyer (9) between a value of zero and an infinite value;

advancing each said element (2) within said heating station (7) by means of said conveyer (9);

maintaining each said element (2) within said heating station (7) for a predetermined time imparting to it, by means of said rotatable support and advancement means (17), at least a rotation about said axis of advancement (72);

providing, within said cooling station (8), at least one current of heat exchange fluid substantially transverse to said axis of advancement (72); and

advancing each said element (2) through said current of fluid imparting to the points thereof displacements according to respective said cylindrical helices; at least one of the variables constituted by the velocity of said displacements and the pitch of said helices being varied, during the traverse of said current, according to the mass distribution along the element (2) itself.

4,604,150

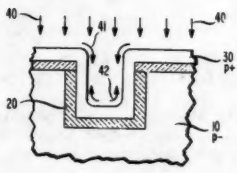
CONTROLLED BORON DOPING OF SILICON

Albert M. Lin, Allentown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 25, 1985, Ser. No. 694,806

Int. Cl.[4] H01L *21/385*

U.S. Cl. 148—188 **11 Claims**



1. A method of making a semiconductor device by steps comprising doping a vertical surface of a silicon body with boron characterized in that said doping is accomplished by steps comprising:

forming a layer of silicon dioxide on said vertical surface;

forming a layer of silicon on said silicon dioxide on said vertical surface, and on a horizontal surface adjacent thereto;

implanting boron into the horizontal portion of said layer of silicon, wherein the vertical portion of said layer of silicon is not substantially implanted thereby;

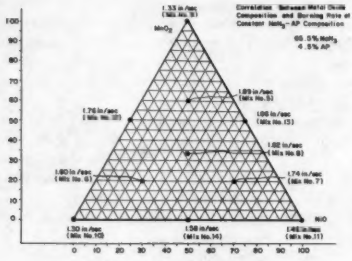
heating said layer of silicon in a dry ambient to redistribute a portion of the implanted boron into said vertical portion of said layer of silicon;

and heating said layer of silicon in an ambient comprising water molecules to oxidize at least a portion of said layer of silicon and substantially promote the transfer of a portion of the boron from said layer of silicon through said layer of silicon dioxide and into said silicon body.

4,604,151
METHOD AND COMPOSITIONS FOR GENERATING NITROGEN GAS

Gregory D. Knowlton, Chandler, and John F. Pietz, Mesa, both of Ariz., assignors to Talley Defense Systems, Inc., Mesa, Ariz.

Filed Jan. 30, 1985, Ser. No. 696,285
Int. Cl.[4] C06B *35/00*
U.S. Cl. 149—35 27 Claims



1. A solid composition for generating nitrogen gas free from noxious and toxic impurities consisting essentially of a mixture of

(a) an alkali metal azide;

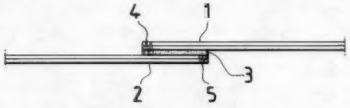
(b) a primary oxidizer consisting essentially of at least a stoichiometric amount of a metal oxide containing sufficient available oxygen to substantially fully oxidize the alkali metal of the azide, said metal oxide being selected from the group consisting of oxides of iron, nickel, manganese, copper, cobalt, titanium, and tin; and

(c) an ammonium perchlorate burn rate enhancer for enhancing the burn rate of the mixture of said alkali metal azide and said primary oxidizer and present as about 1 to 15 weight percent of the composition.

4,604,152
METHOD OF MAKING A STITCHED AND BONDED SEAM

Lasse Liukko, Mariankatu 16 B 18, SF-15110 Lahti, Finland

Filed Sep. 11, 1984, Ser. No. 649,840
Claims priority, application Finland, Sep. 12, 1983, 833260
Int. Cl.[4] B32B *31/12, 7/08*
U.S. Cl. 156—93 4 Claims

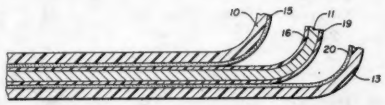


1. A method of making a seam in laminated textile fabric, comprising the steps of separately stitching along the edges of a pair of sheets of fabric with reinforcing stitching, positioning the edge portions of the sheets in lapping relation and offsetting the stitched edges from each other, interposing a layer of thermoadhesive material between the lapping edges, maintaining the lapping edges free of interconnected stitching, and heating the thermoadhesive material to melt said thermoadhesive material and penetrate the molten thermoadhesive material into the fabric and into the stitching to provide a tight and waterproof seam.

4,604,153
METHOD OF MANUFACTURING FIGURES FROM A LAMINATED TAPE AND APPLYING THE SAME TO A DESIRED MEDIUM

Kenneth M. Melbye, Stillwater, Minn., assignor to Kroy Inc., Scottsdale, Ariz.

Continuation of Ser. No. 339,481, Jan. 15, 1982. This application Sep. 5, 1984, Ser. No. 647,806
Int. Cl.[4] B44C *1/10*
U.S. Cl. 156—235 1 Claim



1. A method of manufacturing figures of desired shape from a laminated tape having a top film layer and a bottom carrier layer and applying the same to a desired medium, said method comprising the steps of:

cutting at least one figure of desired shape from said top film layer of a segment of laminated tape to form at least one cut-out figure having an outwardly disposed top surface and a bottom surface, said bottom surface being provided with adhesive properties and being secured to said carrier layer by said adhesive properties;

removing said top film layer from said segment of laminated tape except for that portion comprising said cut-out figures;

placing a segment of adhesive backed transfer tape onto said cut-out figures so that said segment of adhesive backed transfer tape adheres to said top surface of said cut-out figures with an adhesive force greater than that between the bottom surface of said cut-out figures and said carrier layer;

removing said cut-out figures from the laminated tape via the transfer tape in aligned form as a result of the greater adhesive force between said transfer tape and the top surface of said cut-out figures than between the bottom surface of said cut-out figures and said carrier layer;

positioning the transfer tape with said cut-out figures adhered thereto in aligned form with respect to the desired medium; and

transferring said cut-out figures from the transfer tape to the desired medium by adhering the bottom surface of said cut-out figures to said medium and removing said transfer tape from the top surface of said cut-out figures.

4,604,154
APPARATUS AND METHOD FOR GUIDING PLASTIC LABELS TO A LABEL-WRAPPING STATION

Harold R. Fosnaught, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

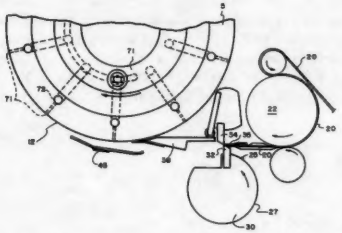
Filed Nov. 28, 1983, Ser. No. 555,788
Int. Cl.[4] B65C *3/16, 9/18*
U.S. Cl. 156—264 6 Claims

1. An apparatus for feeding a coextruded polystyrene label stock regardless of curling to a label-wrapping station for cutting and wrapping a length of the label stock around a container, the label being a sheet and having an outer solid polystyrene layer and an inner foam layer for contact with the container, the apparatus comprising:

means for transporting the label sheet with its length axis substantially parallel to the horizontal; a first label guide means for guiding the sheet towards the label-wrapping station by pushing against one side of the sheet, a rotating member located on the other side of the sheet, the rotating member including a knife for cutting the sheet into labels on the periphery of the member and a turning bar behind the knife on the periphery, the turning bar, after the label

is cut from the sheet, pushing against the sheet from the side opposite the first guide means to turn the label from its path into a second guide means, the knife thus rotating and contacting the sheet to cut the sheet into desired lengths of label sheets to form labels and each label is positively guided into the second guide means, the second guide means guiding each of the cut label sheets into a rotating vacuum drum, the second guide means being so constructed and arranged that the label is applied directly to the vacuum drum for rotating the label around its periphery to the label-wrapping station; and a third means for guiding the sheet to the label-wrapping station including a final feed guide to move the label into the vacuum drum for a positive placement and guidance of the label even during start-up regardless of curling of the label.

5. A method of feeding to a label-wrapping station a polystyrene label sheet stock comprising a solid polystyrene layer and a foam polystyrene layer, regardless of the amount of curl, the method comprising the steps of:



A. transporting the sheet to the wrapping station with the length axis of the sheet substantially parallel to the horizontal;

B. guiding the sheet with a primary feed guide towards a rotating member with a knife for cutting the sheet into labels;

C. pushing against one side of the sheet as the sheet is moving with the primary feed guide;

D. cutting the sheet into desired lengths to form labels with the knife while the sheet is moving;

E. pushing against the cut sheet on the other side of the sheet with a turning bar located on the rotating member;

F. turning the cut label from its path after being pushed by the primary guide towards a secondary guide means and steering the label;

G. steering the label towards a rotary vacuum drum with the secondary guide means and placing the label on the drum periphery; and

H. finally guiding the label around the periphery of the drum with a final guide means to supply the moving label to the wrapping station regardless of curl of the label.

4,604,155

METHOD OF MAKING A MULTI-LAYERED PRESSURE HOSE UTILIZING INTERNAL FLUID PRESSURE

Patrick N. McKiernan, Lurgan, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 16, 1982, Ser. No. 418,919
Int. Cl.[4] F16L *11/04*
U.S. Cl. 156—287 **12 Claims**

2. In a method for producing filamentary reinforced elastomeric hose including:

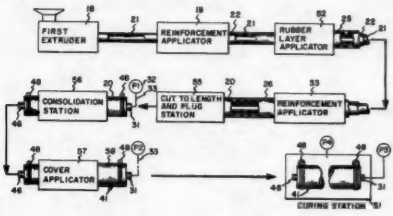
(a) providing an uncured tubular structure having a bore and including a tubular layer of uncured elastomeric material having superposed thereon and in contact therewith a tubular braided layer of textile filaments,

(b) causing uncured elastomeric material to become present in the interstices of the tubular braided layer, and

(c) curing the structure,

the improvement which comprises:

(i) plugging an end of said uncured structure and introducing pressurized gas into the bore of the uncured structure and maintaining gas pressurization therein for a time sufficient to force uncured elastomer material into the interstices of the braided layer, and thereafter releasing the gas pressure,



(ii) applying a cover layer of uncured elastomer material, and

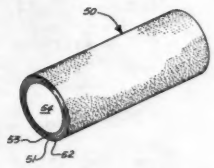
(iii) curing the covered structure at a predetermined temperature exceeding room temperature and a predetermined pressure exceeding atmospheric pressure whilst maintaining pressure in the bore of the covered structure at a predetermined level above that applied to the exterior of the covered structure.

4,604,156

METHOD OF FABRICATING A CYLINDRICAL MULTILAYER SCREEN

Garland E. Raley, and Dean M. Spear, both of Terre Haute, Ind., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 534,359, Sep. 21, 1983, Pat. No. 4,543,299.
This application Jan. 10, 1985, Ser. No. 690,330
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—294 **10 Claims**



1. A method of making a relatively thick cylindrical metal screen for vacuum perforation of plastic film wherein the holes in the screen have substantially straight walls perpendicular to the surface of the screen, comprising stacking and bonding together two or more matched relatively thin cylindrical metal screens diametrically one inside the other, each of said relatively thin metal screens having a plurality of holes therein which have substantially straight walls and which are perpendicular to the surface of their respective relatively thin cylindrical metal screen.

4,604,157

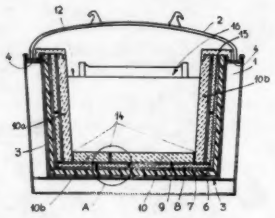
ACID PICKLING TANK FOR METAL STRIPS

Pierre M. Damiron; Jean-Luc Legoupil, both of Paris, and Jacques Brosson, Riom, all of France, assignors to Clecim, Paris, France

Filed May 15, 1985, Ser. No. 734,207
Int. Cl.[4] C23F *1/02*
U.S. Cl. 156—345 **7 Claims**

1. Acid pickling tank for metal strips with a width equal to at least 0.50 m, comprising a metal casing in the form of a

vessel of a great length and with a uniform cross-section, incorporating two side walls, two end walls and a plane bottom, the said vessel being supported by an external structure and covered internally with a layer of rubber, the said rubber layer being itself internally lined with an inner layer made of an acid-resistant material, the said inner layer in contact with the



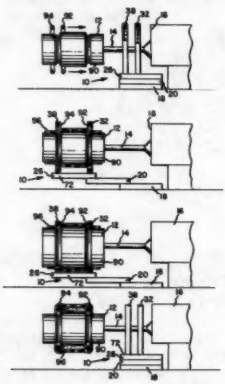
acid consisting of slabs laid side by side, of such dimensions that the bottom of the tank is covered in the width direction by at most three slabs and that the side and end walls are covered over their entire height by a single slab, the said slabs consisting of a natural rock of volcanic origin which has a total SiO_2 and Al_2O_3 of at least 60%, a porosity of between 6 and 30% and a relative density of less than 3.

4,604,158

APPARATUS AND METHOD FOR STORING AND POSITIONING BEAD CORES FOR TIRE BUILDING

Henry D. Broyles, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 31, 1985, Ser. No. 697,022
Int. Cl.[4] B29D *30/32*
U.S. Cl. 156—403 **5 Claims**



1. Apparatus for storing and positioning annular tire bead cores in the building of a tire on an expandable tire building drum mounted on a generally horizontal drum drive shaft supported at one end by a drum drive housing characterized by:

(a) a beam member slidably mounted for movement along said tire building drum;

(b) means for moving said beam member between a bead core positioning location under said drum and a storage position at the inboard end of said drum;

(c) an annular outboard bead core holder having an outboard carriage slidably mounted on said beam member;

(d) means for moving said outboard carriage on said beam member between an outboard bead core positioning location on said drum and a storage location at the outboard end of said beam member in said storage position;

(e) an annular closed inboard bead core holder slidably mounted on said beam member;

(f) means for moving said inboard bead core holder on said beam member between an inboard bead core positioning location on said drum and a storage location at the outboard end of said beam member in said storage position;

(g) said annular outboard bead core holder having two half sections mounted on said outboard carriage for transverse opening movement and means for spreading said half sections to provide clearance for movement over the tire on said drum from said outboard bead core positioning location to said storage position whereby after removal of the tire said bead cores may be moved over said drum and through said outboard bead core holder to positions between said inboard and said outboard bead core holders so that said inboard bead core may be placed and held on said inboard bead core holder; and

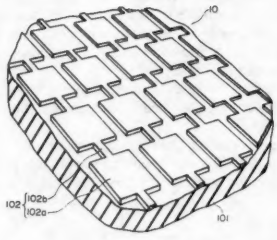
(h) said two half sections of said bead core holder being mounted for transverse closing movement and means to contract said half sections after said outboard bead core is positioned between said inboard and said outboard bead core holders so that said outboard bead core may be placed and held on said outboard bead core holder.

4,604,159

METHOD OF FORMING A LARGE NUMBER OF MONOCRYSTALLINE SEMICONDUCTOR REGIONS ON THE SURFACE OF AN INSULATOR

Yutaka Kobayashi; Akira Fukami, both of Hitachi, and Takaya Suzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,023
Claims priority, application Japan, Jun. 13, 1983, 58-105275
Int. Cl.[4] C30B *13/20*
U.S. Cl. 156—617 R **35 Claims**



1. A method of forming a large number of monocrystalline semiconductor regions on a surface of an insulator, the monocrystalline semiconductor regions having a uniform orientation, comprising the steps of:

(a) forming a large number of island regions and connecting regions, the connecting regions connecting said island regions lying in a predetermined direction, the island and connecting regions being formed on said surface of said insulator, said island regions being made of a polycrystalline or amorphous semiconductor, said connecting regions acting to thermally connect the island regions; and

(b) melting and regrowing said island regions sequentially in said predetermined direction to form the monocrystalline semiconductor regions having said uniform orientation.

4,604,160
METHOD FOR MANUFACTURE OF PRINTED WIRING BOARD

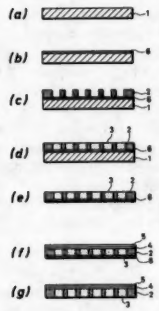
Kanji Murakami, Mito; Haruo Akahoshi; Mineo Kawamoto, both of Hitachi; Motoyo Wajima; Yoichi Matsuda, both of Hitachi; Kyoji Kawakubo, Naka; Minoru Kanechiku, Katsuta; Toyofusa Yoshimura, Naka, and Makoto Matsunaga, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 8, 1985, Ser. No. 689,802

Claims priority, application Japan, Jan. 11, 1984, 59-3152

Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **B05D** *5/12;* **C25D** *5/02*

U.S. Cl. 156—630 **18 Claims**



1. A method for the manufacture of a printed wiring board, characterized by comprising the following steps in the order mentioned:

(1) the step of applying a metallic film on a substrate,

(2) the step of forming a plating resist on said metallic film except the portion intended for the formation of a conductor circuit,

(3) the step of plating said metallic film surface covered with said plating resist thereby forming a conductor circuit,

(4) the step of separating said metallic film, said conductor circuit, and the said plating resist jointly from said substrate,

(5) the step of transferring them to an insulating substrate, and

(6) the step of removing said metallic film so transferred by etching.

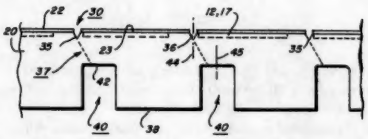
4,604,161
METHOD OF FABRICATING IMAGE SENSOR ARRAYS

Mehdi N. Araghi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 2, 1985, Ser. No. 729,705

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—645 **5 Claims**



1. A method of fabricating a high resolution sensor array or chip capable of being abutted against other like arrays to form a longer array without image loss or distortion at the array junctions, comprising the steps of:

(a) etching a small V-shaped groove in one side of a (100) silicon wafer defining the chip end, the walls of the V-shaped groove paralleling the (111) crystalline plane of the wafer;

(b) forming a relatively wide groove in the opposite side of the wafer, the axis of the said wide groove being parallel to and offset from the axis of the V-shaped groove by an amount such that the (111) crystalline plane in which one wall of the V-shaped groove lies intercepts said wide groove at substantially the midpoint of said groove;

(c) applying a downward bending force to the wafer proximate the V-shaped groove along the (111) plane so that the wafer fractures and pivots about the bottom of said wide groove with the fracture extending from the bottom of the V-shaped groove to said wide groove whereby to provide a uniformly flat precisely controlled end for the chip; and

(d) forming the opposite end of the chip in the same manner to provide an array having uniformly flat precisely controlled ends for butting with like ends of other arrays to form a longer array.

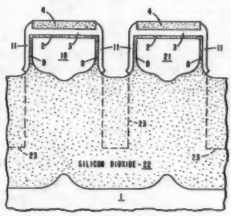
4,604,162
FORMATION AND PLANARIZATION OF SILICON-ON-INSULATOR STRUCTURES

Zbigniew P. Sobczak, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 641,646, Aug. 17, 1984, abandoned, which is a continuation of Ser. No. 503,997, Jun. 13, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 812,531

Int. Cl.[4] H01L *21/308, 21/312, 21/318*

U.S. Cl. 156—657 **11 Claims**



1. A process for fabricating planarized silicon insulator structures on a semiconductor wafer, comprising the steps of:

etching a monocrystalline silicon substrate to form islands of silicon having defined perimeters;

capping the tops and sides of the silicon islands with oxidation masks;

anisotropically etching deeper into the monocrystalline silicon substrate between the capped island and with no material undercut of the capped islands to increase the relative height of the islands;

oxidizing the lateral walls of silicon formed by the anisotropic etch until the capped silicon is electrically isolated from the silicon substrate;

depositing a dielectric layer to a thickness greater than the height of the islands;

forming a planarized polymer layer over the dielectric layers;

simultaneously etching the polymer and dielectric layers to remove polymer and dielectric material at substantially equal rates until the polymer layer is absent; and

simultaneously etching the dielectric layer and the electrically isolated silicon to remove dielectric material and silicon at substantially equal rates.

4,604,163

VISCOSITY MODIFIERS FOR GRAFTED STARCH POLYMER SOLUTIONS

Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 585,461, Mar. 2, 1984, which is a continuation-in-part of Ser. No. 500,211, Jun. 2, 1983, abandoned. This application Oct. 17, 1985, Ser. No. 788,360
Int. Cl.[4] D21H *3/28*
U.S. Cl. 162—175 5 Claims

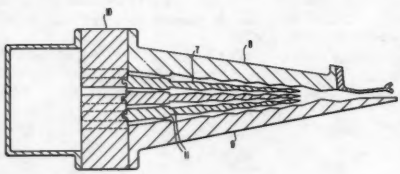
1. A fibrous substrate having been prepared with a solution comprised of from between about 20 and about 35 percent on a solids basis of a graft polymer comprised of from about 70 to about 30 weight percent of a starch substrate, about 30 to about 70 weight percent of vinyl polymeric segments and a viscosity reducing amount cinnamic acid material.

4,604,164

FLOW RESTRAINING ELEMENTS IN THE HEADBOX OF A PAPER MACHINE

Haruyoshi Fujiwara, and Tetsuo Makino, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,431
Int. Cl.[4] D21F *1/02*
U.S. Cl. 162—343 8 Claims



1. In a headbox for a paper making machine, the headbox having a iop plate and a bottom plate defining a chamber therebetween, a perforated plate connected to an inlet end of said top plate and an inlet end of said bottom plate to form an inlet of said chamber, said top plate and said bottom plate approaching each other at an outlet end spaced from said inlet end to form an outlet of said chamber, and a plurality of flow restraining elements disposed one above another in said chamber to define a plurality of flow paths spaced one above another in said chamber, said flow restraining elements extending from said inlet to said outelt, having free ends at said outlet, and being removably connected at one end thereof to said perforated plate, the improvement wherein;

each of said flow restraining elements has an upper surface and a lower surface which approach each other until they meet at said free end in a downstream direction away from said perforated plate toward said outlet end,

said upper and lower surfaces each having a surface portion having corrugated patterns which are symmetrical with respect to each other and formed by a cross section perpendicular to said downstream direction, which alternately gradually increases and decreases along the length of said flow restraining elements to said free end so as to define alternating portions of increased and reduced cross section, such that the increased cross sections gradually decrease in said downstream direction and the decreased cross sections gradually decrease in said downstream direction, said cross sections varying sufficiently gradually between successive portions of increased and reduced cross section so as to resist warping during variable temperature use,

said upper surface and said lower surface defining an angle of 1° to 15° therebetween,

said free ends of said flow restraining elements being formed from a flexible material selected from the group of flexible material consisting of rubber and plastic, said material having a low modulus of elasticity and a specific gravity of about 1.0 so as to be easily deformable,

each of said flow restraining elements being provided with an upper recessed protion on said upper surface and a lower recessed portion on said lower surface, said upper and lower recessed portions being respectively defined by an upper wall on said upper surface and a lower wall on said lower surface which are substantially perpendicular to said downstream direction, said flow restraining element being arranged in said chamber with said recessed portions adjacent one another to create an abruptly enlarged area in each of said paths between adjacent flow restraining elements, said recessed portions being located between said perforated plate and said surface portions of said flow restraining elements having said corrugated patterns, and

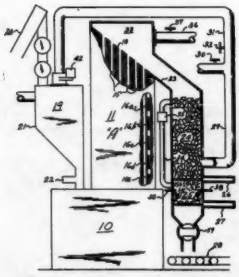
said flow restraining elements being positioned in said chamber with said corrugated patterns symmetrical with respect to each other, whereby the flow paths between adjacent flow restraining elements have cross-sectional configurations which gradually increase and gradually decrease, thus causing liquid which flows between said flow restraining elements in said downstream direction to have a speed which decreases and increase to create a stirring effect on the liquid.

4,604,165

APPARATUS FOR PROCESSING BULK MATERIALS BY INDUCTION

Albert Calderon, 1065 Melrose St., Bowling Green, Ohio 43402

Continuation-in-part of Ser. No. 401,620, Jul. 26, 1982, abandoned, Ser. No. 229,317, Jan. 29, 1981, Pat. No. 4,389,283, Ser. No. 209,831, Nov. 24, 1980, Pat. No. 4,376,033, Ser. No. 166,172, Jul. 7, 1980, Pat. No. 4,494,984, Ser. No. 153,159, May 27, 1980, abandoned, and Ser. No. 131,137, Mar. 17, 1980, Pat. No. 4,464,197, said Ser. No. 229,317, is a continuation-in-part of Ser. No. 201,699, Oct. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 921,760, Jul. 3, 1978, abandoned. This application Feb. 11, 1983, Ser. No. 465,687
Int. Cl.[4] C10B *1/04, 19/00*
U.S. Cl. 202—113 29 Claims



1. Apparatus for the processing of a material that heats poorly or not at all by induction comprising the following:

(a) means for charging said material;

(b) a plurality of adjacent tubular comaprtments whose walls are formed of a substance which is capable of being heated directly by induction, each compartment defining therewithin a space for receiving a charge of said material;

(c) insulating means immediately surrounding the walls of each adjacent compartment, said insulating means being formed of a (substance that does not heat by induction;

(d) induction coil means surrounding said plurality of compartments with said plurality of compartments commonly sharing said induction means and said induction coil means not individually surrounding any of said compart-

ments, said induction coil means directly heating the walls of said compartments while said walls in turn effect the heating of said material contained within said compartments; and

(e) means for discharging said material from said plurality of compartments.

4,604,166

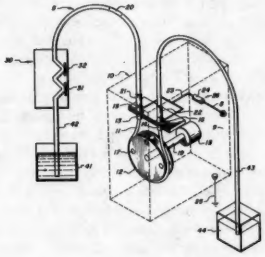
APPARATUS AND PROCESS FOR REDUCING PERISTALTIC PUMP NOISE IN A HIGH IMPEDANCE ELECTROCHEMICAL MEASURING SYSTEM

Melvin S. Weinberg, Nashua, N.H.; Alan D. Cormier, Newburyport, Mass., and Ronald L. Jones, Newton, N.H., assignors to Amdev, Inc., Haverhill, Mass.

Filed Aug. 28, 1984, Ser. No. 645,018

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—1 T **18 Claims**



1. An improved high impedance electrochemical measruing system having reduced peristaltic pump noise, said system including a high impedance measuring electrode for analyzing a fluid sample, a peristaltic pump having an elastomeric tubing streteched over rollers, and a fluid conduit extending from a first end of said elastomeric tubing to said measuring electrode, said rollers being movable over said elastomeric tubing for moving said fluid sample through said fluid conduit between said pump and said measuring electrode, said improvement comprising:

a nonconductive fluid segment having a first impedance, said fluid segment being disposed in said fluid conduit for electrically isolating said pump and said measuring electrode; and

an AC capacitive ground having a second impedance less than said first impedance, said AC capacitive ground being electrically connected to said fluid sample adjacent said first end of said peristaltic tubing for damping the peristaltic pump noise generated by said pump without significantly affecting the response time or precision of said measuring electrode.

4,604,167

SILVER PLATING SOLUTION AND SILVER PLATING PROCESS AND PRETREATMENT SOLUTION THEREFOR

Shinichi Wakabayashi, and Masako Takoh, both of Nagano, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

Filed Jan. 26, 1984, Ser. No. 574,253

Int. Cl.[4] C25D *3/46, 5/34*

U.S. Cl. 204—29 **6 Claims**

1. A pre-dipping solution for preventing the immersion deposition of silver on a suface of copper or copper alloy in an electrolytic plating process for plating silver onto a copper or copper alloy surface, comprising a cyclic thion compound selected from the group consisting of 2-thiobarbituric acid, 2-thiouramil, 4-thiouramil, 3-thiourazol and 3-aminorhodanine, and an alkali metal citrate or phosphate.

2. An electrolytic plating process for plating silver onto a surface of copper or copper alloy, comprising treating the copper or copper alloy surface with a cyclic thion compound selected from the group consisting of 2-thiobarbituric acid, 2-thiouramil, 4-thiouramil, 3-thiourazol and 3-aminorhodanine and plating the copper or copper alloy surface in an electrolytic plating solution containing an alkali metal silver cyanide.

4,604,168

PRETREATMENT FOR ELECTROPLATING MINERAL-FILLED NYLON

Sonya W. Liu, Warren, and James H. Lindsay, Fenton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 20, 1984, Ser. No. 684,268

Int. Cl.[4] C25D *5/54*

U.S. Cl. 204—30 **4 Claims**

1. A method of preparing a surface of molded mineral-filled nylon for electroplating thereon, comprising the steps of:

exposing said surface to a plasma glow discharge so as to etch, and increase the bonded oxygen content of, said surface without substantially increasing the mineral content thereof;

vacuum depositing a thin film of bonding metal onto said etched and oxygen-enriched surface, said bonding metal being selected from the group consisting of chromium and titanium;

vacuum depositing a thin film of nickel onto said bonding metal before significant oxidation of said bonding metal occurs, said nickel film serving to substantially prevent oxidation of said bonding metal before and after subsequent metallizing steps; and

before significant oxidation of said nickel occurs, vacuum depositing a thin film of copper onto said nickel to substantially prevent oxidation of said nickel and enhance the electrical conductivity of the surface for subsequent electroplating operations.

4,604,169

PROCESS FOR METAL PLATING A STAINLESS STEEL

Shoji Shiga, Utsunomiya; Takayuki Hayakawa, Nikko, and Yasuo Kamiyama, Imaichi, all of Japan, assignors to Furukawa Electrical Company, Ltd., Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,215

Claims priority, application Japan, Jul. 9, 1984, 59-141973; Jul. 9, 1984, 59-141972

Int. Cl.[4] C25D *5/12, 5/26, 5/36*

U.S. Cl. 204—34 **9 Claims**

1. A process for metal plating a stainless steel material comprising (1) a first step of subjecting the stainless steel material to an electrolysis treatment using the stainless steel material as a cathode in an aqueous solution consisting essentially of free HCl in an amount at least 30 g/l and at least one species of Ni and Co ions in an amount at least 0.1 g/l; (2) a second step of metal plating the same by Ni or an alloy of Ni in a weakly acidic Ni plating bath; and (3) a third step subsequently plating the same by a noble metal or an alloy thereof.

4,604,170

MULTI-LAYERED DIAPHRAGM FOR ELECTROLYSIS

Haruhisa Miyake; Manabu Suhara; Yoshio Sugaya, and Hirofumi Horie, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,054

Claims priority, application Japan, Nov. 30, 1984, 59-251736

Int. Cl.[4] C25B *1/34, 1/46, 13/02*

U.S. Cl. 204—98 **9 Claims**

1. A multi-layered diaphragm for electrolysis, which comprises a porous layer of a fluorine-containing polymer having a pore diameter of from 0.05 to 10 μm, a porosity of from 30 to 95% and a thickness of from 30 to 450 μm and with its interior and anode-side surface being hydrophilic, and an ion exchange

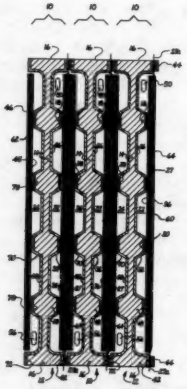
resin layer supported on the cathode side thereof and having a thickness thinner than the porous layer but of at least 5 μm and an ion exchange capacity of from 0.5 to 2.0 meq/g dry resin, the total thickness being from 35 to 500 μm.

4,604,171

UNITARY CENTRAL CELL ELEMENT FOR FILTER PRESS, SOLID POLYMER ELECTROLYTE ELECTROLYSIS CELL STRUCTURE AND PROCESS USING SAID STRUCTURE

Gregory J. E. Morris, Lake Jackson; John R. Pimlott, Sweeny; Richard N. Beaver, Angleton; Hiep D. Dang, Lake Jackson, and Sandor Grosshandler, Houston, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 682,738, Dec. 17, 1984, abandoned.
This application Sep. 9, 1985, Ser. No. 774,255
Int. Cl.[4] C25B *1/46, 13/02*
U.S. Cl. 204—98 **50 Claims**



1. In a cell structure used in forming a bipolar electrode, filter press, solid polymer electrolyte, electrolytic cell unit, which unit is capable of being combined with other cell units to form a plurality of electrolysis cells;

each of said electrolysis cells having at least one planarly disposed solid polymer electrolyte membrane separating the anode compartment and cathode compartment;

said cell structure having a central barrier which physically separates an anode compartment of an electrolysis cell located on one side of the barrier from a cathode compartment of an adjacent electrolysis cell located on the opposite side of the barrier;

each of said electrolysis cells at least having an anode component and a cathode component, wherein at least one of such components is electrocatalytically active and is embedded in or bonded to the solid polymer electrolyte membrane;

said central barrier electrically connecting the anode component of one side of said structure to the cathode component on the opposite side of said structure;

said anode and cathode compartments having a peripheral structure around their periphery to complete the physical definition of said compartments;

said cell structure also having an electrical current transfer means associated with it for providing electrical current paths through the central barrier from its adjacent cathode compartment to its adjacent anode compartment;

and which cell structure includes anode component and cathode component stand-off means for maintaining the anode component and cathode component of the two electrolysis cells adjacent to the central barrier at a predetermined distances from the central barrier;

the improvement which comprises:

the central barrier, the anode and cathode compartment peripheral structures, the anode component stand-off means, the cathode component stand-off means, and at least part of the electrical current transfer means all being integrally formed into a unitary central cell element made from a single casting of a castable metal; and, further

said castable metal being electrically conductive so as to be the part of the electrical current transfer means which transfers electricity through the central barrier from the adjacent cathode compartment to the adjacent anode compartment; and

said unitary central cell element being formed in such a fashion so as to provide the structural integrity required to physically support the contents of the adjacent electrolyte compartments as well as to support the associated electrolysis cell appurtenances which are desired to be supported by the unitary central cell element; and

said anode component stand-off means and that part of the electrical current connecting means located in the unitary central cell element on the anode side of the central barrier being combined into a multiplicity of anode component bosses projecting a predetermined distance outwardly from the central barrier into the anode compartment adjacent to the central barrier, said anode component bosses being capable of being mechanically and electrically connected either directly or indirectly to the anode component of said anode compartment; and

said cathode component stand-off means and that part of the electrical current connecting means located on the cathode side of the central barrier beinig combined into a multiplicity of cathode component bosses projecting a predetermined distance outwardly from the central barrier into the cathode compartment adjacent to the central barrier, siad cathode component bosses being capable of being mechanically and electrically connected either directly or indirectly to the cathode component; and

said anode component bosses being spaced apart in a fashion such that fluids can freely circulate throughout the totality of the adjacent anode compartment, and, likewise, said cathode component bosses being spaced apart in a fashion such that fluids can freely circulate throughout the totality of the adjacent cathode compartment;

at least one of said electrode components comprising:

an interconnected, electrically conductive, electrocatalytic material bonded to or embedded in the solid polymer electrolyte membrane; and

a hydraulically permeable current collector electrically connected to said electrically conductive material and to said electrode bosses.

24. A process of electrolyzing sodium chloride brine comprised of passing electricity through a series of electrolysis cells whose cell structures are comprised of adjoining unitary cell elements like those defined in claim **1**.

4,604,172

PROCESS FOR THE ELECTROLYSIS OF SODIUM CHLORIDE

Rolf Hengel, Burgkirchen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 6, 1985, Ser. No. 762,930
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1984, 3429182
Int. Cl.[4] C25B *1/14*
U.S. Cl. 204—98 **4 Claims**

1. A process for the electrolysis of an aqueous solution of sodium chloride in electrolytic cells divided into an anode chamber and a cathode chamber by a cation exchanger membrane of a perfluorinated polymer with carboxyl groups, wherein the cation exchanger membrane comprises a copolymer which is composed of recurring units of

$$-CF_2-CF_2- \text{ and } -CF_2-CF(-O-CF_2-CF_2-COONa)-$$

and has an ion exchange capacity of 1.55 to 1.74 m-equivalents/g of dry polymer in the H^+ form and a longitudinal expansion at room temperature, caused by saponification of the ester form in 25% by weight aqueous potassium hydroxide solution at 90° C. over a period of 12 hours, of between 3.2 and 6.0%.

4,604,173

LOW OXYGEN OVERVOLTAGE LEAD ANODES

Antonio Nidola, and Oronzio de Nora, both of Milan, Italy, assignors to Oronzio de Nora Impianti Electtrochimici, S.p.A., Milan, Italy

Division of Ser. No. 568,766, Jan. 6, 1984, Pat. No. 4,548,697. This application Aug. 7, 1985, Ser. No. 763,384

Claims priority, application Italy, Feb. 14, 1983, 19565 A/83

Int. Cl.[4] C25C *1/00*; C25B *1/02*

U.S. Cl. 204—105 R **12 Claims**

1. In the process of electrowinning a metal from an aqueous solution of a sulphate thereof, the improvement of using as oxygen evolving anode an activated catalytic antimony-free lead base anode having improved oxygen overvoltage prepared by contacting the antimony-free lead base with a molten bath of at least one hydrated salt belonging to the group of nitrates and persalts of a member selected from the group of cobalt, iron, and nickel at a temperature lower than the melting temperature of said antimony-free lead base and for a time sufficient to activate the surface and obtain said activated catalytic lead base anode and wherein said lead base exhibits improved oxygen overvoltage as a consequence of the process by which it was prepared.

4,604,174

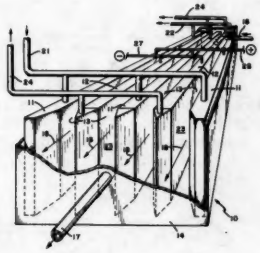
HIGH FLOW ELECTROFILTRATION

James M. Bollinger, Stamford, and Peter R. Klinkowski, Norwalk, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 30, 1985, Ser. No. 728,957

Int. Cl.[4] C02F *1/46*

U.S. Cl. 204—151 **28 Claims**



18. A process for dewatering a slurry in an electrically augmented crossflow filter device, said electrically augmented crossflow filter device comprising a housing, a narrow, elongated feed-product channel within said housing, a feed inlet at one extremity of said feed-product channel, said feed-product channel defined in part by a pair of opposed walls, a filtrate channel lying parallel to said feed-product channel and contiguous with a first of said walls, said first wall comprising a filter medium, an electrode element of a first polarity in said filtrate channel, a filtrate outlet for withdrawing filtrate from said filtrate channel, an electrolyte channel lying parallel to said feed-product channel and contiguous with the second of said walls, said second wall comprising an ion-pervious member, an electrode element of a second polarity in said electrolyte channel, means for passing an electrolyte solution through said electrolyte channel to immerse said electrode element therein in a flowing stream of electrolyte, means for establishing a pressure differential between said feed-product channel and said filtrate channel across said first wall and means for establishing an electric field perpendicular to the axis of said feed-product channel between said electrode elements, comprising:

pumping slurry into said feed-product channel;

maintaining a velocity of said slurry in said feed-product channel sufficient to inhibit deposition of solids from said slurry on the walls of said channel;

establishing an electric field perpendicular to the axis of said feed product channel between the opposed electrode elements located in said filtrate channel and said electrolyte channel;

withdrawing filtrate;

continuously circulating electrolyte through said electrolyte channel whereby the electrode therein is immersed in electrolyte; and

withdrawing a slurry enriched in solids content from said feed-product channel.

4,604,175

PROCESS FOR REGENERATION OF IRON-COPPER CHLORIDE ETCHING SOLUTION

Jury I. Naumov, ulitsa Grubbe, 10, kv. 1; Dmitry K. Juzefovich, Moskovskoe shosse, 13, kv. 42; Valentina S. Epifanova, poselok Podnovie, 156, kv. 1; Vladimir I. Kucherenko, ulitsa Sverdlova, 93, kv. 77; Valery N. Flerov, ulitsa Kovalikhinskava, 30, kv. 80, all of Gorky; Anatoly M. Praporov, ulitsa Belovezhskava, 77, kv. 159, Moscow; Vladimir P. Shustov, ulitsa Grizhina, 23, korpus 5, kv. 67, Moscow; Alexel E. Sychev, prospekt Zagorskogo, 5, kv. 43, Moscow; Georgy V. Korolev, ulitsa Korolenko, 19a, kv. 9, Gorky; Evgeny P. Kotov, ulitsa Nedelina, 34, kv. 7, and Yan N. Derevyanko, ulitsa 2 Pugachevskava, 4, korpus 2, kv. 136, both of Moscow, all of U.S.S.R.

Continuation of Ser. No. 447,530, Dec. 7, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,529

Int. Cl.[4] C02F *1/46*

U.S. Cl. 204—151 **8 Claims**

1. A process for regeneration of an iron-copper chloride etching solution in an electrolyzer having electrodes comprising:

initially dividing said iron-copper chloride etching solution into at least two separate streams;

supplying the first stream into the electrolyzer in a first zone between a cathode and an anode, said anode being made of a porous material having pores permeable to elemental chlorine, and said first stream being introduced at a rate ensuring laminary flow of said iron-copper chloride etching solution along the surface of the electrodes;

supplying the second stream into said electrolyzer in a second zone between the anode and the shell of the electrolyzer at a rate ensuring turbulent flow of said iron-copper chloride etching solution along the surface of the anode;

electrochemically reducing ions of bivalent copper to metallic copper on the cathode;

electrochemically oxidizing ions of bivalent iron to ions of trivalent iron on the anode, whereby elemental chlorine is formed which diffuses through pores of the anode into the second zone and oxidizes ions of bivalent iron in said second zone.

4,604,176

METHOD OF IMPROVING MAGNETORESISTIVE EFFECT IN THIN MAGNETIC FILM

Maynard C. Paul, Bloomington, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,228

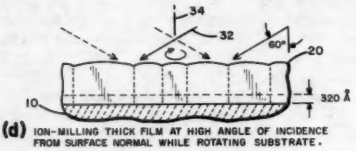
Int. Cl.[4] H01F *10/02*

U.S. Cl. 204—192 M **8 Claims**

1. In a thin film magnetic film the method of improving its magnetoresistive effect, comprising:

forming a thin magnetic film upon a suitable substrate, initially said film consisting of separated grains, at a temperature that is in the range of approximately 300° C. to 320° C.;

increasing the thickness of said thin magnetic film until the thin magnetic film becomes continuous, with the boundary height between grains substantially greater than a pre-determined thin magnetic film thickness;



(d) ION-MILLING THICK FILM AT HIGH ANGLE OF INCIDENCE FROM SURFACE NORMAL WHILE ROTATING SUBSTRATE.

rotating said substrate about an axis that is perpendicular to the plane of said substrate;

directing an ion beam upon said thin magnetic film at an angle with respect to the normal to the plane of said substrate; and

ion-milling said thin magnetic film to said predetermined thin magnetic film thickness in a manner that modifies the usual grain structure for a film of that thickness.

4,604,177

ELECTROLYSIS CELL FOR A MOLTEN ELECTROLYTE

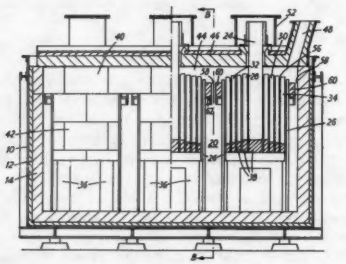
Olivo G. Sivilotti, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Division of Ser. No. 513,234, Jul. 13, 1983, Pat. No. 4,514,269. This application Feb. 11, 1985, Ser. No. 700,293

Claims priority, application United Kingdom, Aug. 6, 1982, 8222665

Int. Cl.⁴ C25C *3/04, 3/22*

U.S. Cl. 204—244 **4 Claims**



1. An electrolyte cell for the production of a metal by electrolysis of a molten electrolyte which is more dense than the metal, comprising,

an electrolysis chamber **16** including at least one electrode assembly of a anode **24** having a major face and also at least one other face selected from an end face and a bottom face, one or more intermediate bipolar electrodes **28, 30, 32, 34** arranged facing not only the major face of the anode but also at least one other face of the anode, and a cathode **26** having a front face facing an intermediate bipolar electrode and a back face, the electrodes defining electrolysis regions between them, and a gas collection space **44** above the assembly,

a metal collection chamber **18** in communication with the top and bottom of the electrolysis regions, but screened from the gas collection space,

a duct **20** defined by the back face of the cathode and leading to the metal collection chamber and to the gas collection space to cause gas to separate and electrolyte/metal mixture to flow to the metal collection chamber,

the one or more intermediate bipolar electrodes having top edges arranged to permit electrolyte/metal mixture rising from the electrolysis regions to spill out over the bipolar electrodes and cathode and into the duct,

and means **22**, for maintaining the surface of the electrolyte/metal mixture at a substantially constant level.

4,604,178

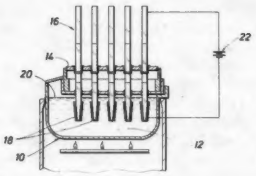
ANODE

Dale R. Fiegener, and Felix J. Broussard, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1985, Ser. No. 707,312

Int. Cl.⁴ C25C *7/02;* **C25B** *11/12*

U.S. Cl. 204—286 **19 Claims**



1. A sacrificial anode comprising an elongate graphite anode body having first and second end faces and first and second similar threaded graphite connector means connecting to said body to support a similar graphite anode body, said connector means having:

(a) collar means with an internal axially hollow passage;

(b) separate headed pin means received in said collar means for securing said pin means thereby at the head;

(c) said collar means having a thread of one hand for engagement with the thread of said body; and

(d) said pin means having a threaded extending portion to join to a second and similar body wherein the threads are of the opposite hand.

4,604,179

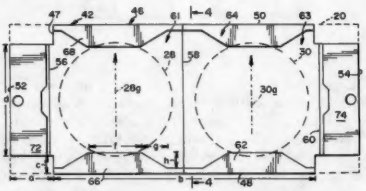
SPUTTERING-SYSTEM BAFFLE

Atef Eltoukhy, San Jose, and Rick C. Price, Fremont, both of Calif., assignors to Trimedia Corporation, Fremont, Calif.

Filed Feb. 28, 1985, Ser. No. 706,737

Int. Cl.⁴ C23C *15/00;* **H01J** *37/08*

U.S. Cl. 204—298 **7 Claims**



1. In a sputtering apparatus having a target adapted to sputter a crystalline material on a substrate surface, to form a thin film thereon, and means for moving the substrate linearly, and without rotation, in a front-to-back direction below such target, successively through front and back deposition regions along a path which is offset from the front-to-back centerline of the target, a baffle for achieving a substantially isotropic

grain structure in the sputtered crystalline material, comprising:

front and back shields positioned between the target and the moving means, for limiting deposition of sputtered material onto the substrate carried on the moving means, predominantly to substrate regions which directly underlie the target, and

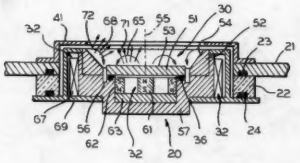
a pair of baffle strips (a) positioned above either side of the substrate, with such in the front deposition region, to effect substantially symmetrical, unhindered side-to-side sputtering of material onto the substrate in such front deposition region, and (b) extending between the two shields in a generally front-to-back direction.

4,604,180

TARGET ASSEMBLY CAPABLE OF ATTAINING A HIGH STEP COVERAGE RATIO IN A MAGNETRON-TYPE SPUTTERING DEVICE

Yohichi Hirukawa; Toshiyuki Nozaki, and Naokichi Hosokawa, all of Tokyo, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Jan. 18, 1985, Ser. No. 692,837
Claims priority, application Japan, Jan. 20, 1984, 59-8939
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 **18 Claims**



1. A target assembly for use in a sputtering device comprising holding means for holding at least one object in a face to face relationship with said target assembly, and electric field producing means for producing an electric field between said target assembly and said holding means, said at least one object being covered with a layer at a step coverage ratio defined in relation to steps left on said at least one object, said target assembly comprising:

a first target made of a predetermined material having a planar surface surrounded by a circular periphery and having a center axis perpendicular to said planar surface, a said planar surface being kept substantial parallel to said at least one object;

a second target made of said predetermined material having an inner periphery adjacent to and concentric with said circular periphery, an outer periphery placed outside said inner periphery relative to said planar surface, and a sloping surface extending between said inner and outer peripheries so that said outer periphery is nearer said holding means than said inner periphery;

a first magnet which is magnetically coupled to said first target for producing a first part of a magnetic field which locally intersects said electric field to sputter said planar surface; and

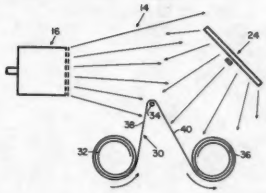
a second magnet which is magnetically coupled to said second target for producing a second part of said magnetic field which locally intersects said electric field to sputter said sloping surface and to form said layer of the predetermined material on said at least one object with a cooperation of said first and said second parts of said magnetic and said electric fields so that said step coverage ratio becomes substantially uniform on each step of said at least one object.

4,604,181

APPARATUS FOR PRODUCING OXIDATION PROTECTION COATINGS FOR POLYMERS

Michael J. Mirtich, North Olmsted; James S. Sovey, Strongsville, and Bruce A. Banks, Olmsted Township, Cuyahoga County, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 649,330, Sep. 14, 1984, Pat. No. 4,560,577.
This application Jul. 31, 1985, Ser. No. 761,235
Int. Cl.[4] C23C *14/46*
U.S. Cl. 204—298 **8 Claims**



1. Apparatus for coating a polymeric material with an oxidation protecting film comprising

an ion beam source for furnishing an ion beam for cleaning a surface of said polymeric material, and

a sputter target mounted such that a beam of ions from an ion source can bombard said target for ion sputter coating said ion beam cleaned surface with a mixture of metal oxide and polymer to form said oxidation protecting film, said sputter target comprising

a first portion of a metal oxide material, and

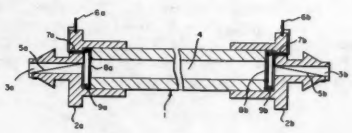
a second portion of a polymer material having a low oxidation rate.

4,604,182

PERFLUOROSULFONIC ACID POLYMER-COATED INDICATOR ELECTRODES

James L. Seago, Bear, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 523,168, Aug. 15, 1983, Pat. No. 4,517,291.
This application Jan. 29, 1985, Ser. No. 696,196
Int. Cl.[4] C12Q *1/54*
U.S. Cl. 204—403 **11 Claims**



1. A flow-through enzyme reactor for the amperometric determination of a constituent of interest contained in a liquid sample, comprising:

a first and a second end member, each having an internal chamber communicable with a source and a sink, respectively, of said liquid sample, said first and second chambers each having disposed therein a noble metal wire having coated thereon a thin film of a perfluorosulfonic acid polymer, said wires being externally connectable to electronic circuitry, said end members being made from an insulating material; and

a central member having an internal chamber adapted to contain an immobilized oxidase enzyme, said chamber in communication with said internal chambers of said end members, said central chamber being separated from each of said end chambers by a foraminous septum, said septum being capable of containing the immobilized enzyme

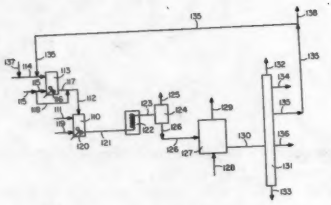
within the central chamber, said central chamber being made from an inert, electrically conductive material.

4,604,183

CATALYTIC PROCESS FOR HYDROCONVERSION OF SOLID CARBONACEOUS MATERIALS

Edward H. Edelson, Maple Shade; Edward I. Stiefel, Bridgewater; Russell R. Chianelli, Somerville, all of N.J., and Catherine L. Coyle, Karlsruhe, Fed. Rep. of Germany, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 6, 1985, Ser. No. 741,993
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—420 **19 Claims**



1. An improved process for hydroconverting solid carbonaceous materials comprising:

(a) forming a feed mixture of a solid carbonaceous material and an ammonium and/or hydrocarbyl substituted ammonium salt of a metal-sulfur analog of cubane or a mixture of such analogs which metal has hydrogenation catalytic activity when used as a sulfide;

(b) subjecting this mixture to hydroconversion at a temperature within the range from about 500° to about 900° F. at a total pressure within the range from about 500 to about 7000 psig and with a hydrogen partial pressure within the range from about 400 to about 5000 psig; and

(c) recovering a normally liquid product from the conversion effluent.

4,604,184

MODIFIED COAL-TAR PITCH

Samuel Cukier, Toronto, and Henry A. F. L. Kremer, Thornhill, both of Canada, assignors to Domtar Inc., Montreal, Canada

Continuation-in-part of Ser. No. 552,252, Nov. 16, 1983, Pat. No. 4,517,072, which is a continuation of Ser. No. 264,294, May 18, 1981, abandoned. This application Feb. 4, 1985, Ser. No. 698,022
Int. Cl.[4] C10C *1/18, 3/08*
U.S. Cl. 208—22 **2 Claims**

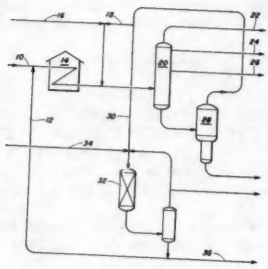
1. A coal-tar pitch material, obtained by the process which consists in mixing an undistilled coaltar material with a solvent which consists of at least one of the following n-methyl-2-pyrollidone and the fraction of a coal-tar distillate which boils between 100° and 350° C., said mixing being carried out at a temperature such as to form a solvent-dissolved fraction and a solvent-undissolved fraction, separating and removing said solvent-undissolved fraction of said undistilled coal-tar material, said undissolved fraction containing Q.I. having a high content of ash-forming impurities and using said solvent-dissolved fraction to produce coal-tar material with a decreased Q.I. and lower impurities by distilling said solvent-dissolved fraction of said undistilled coal-tar material to obtain from said solvent-dissolved product a pitch material having a toluene insoluble content of over 20%, a beta resin content of over 15%, a quinoline insoluble content of less than 5% and ash content of less than 0.1%.

4,604,185

CO-PROCESSING OF STRAIGHT RUN VACUUM RESID AND CRACKED RESIDUA

James R. McConaghy, Jr., and Ardis L. Anderson, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jul. 2, 1985, Ser. No. 750,968
Int. Cl.[4] C10G *47/32*
U.S. Cl. 208—56 **4 Claims**



1. A process for simultaneously processing straight run vacuum resid and cracked residuum to produce distilled products and a 1,000° F.+ fraction in an amount of not more than the sum of 40 volume percent of the 1,000° F.+ material in the straight run vacuum resid and the 1,000° F.+ fraction of the cracked residuum, said process comprising:

(a) combining a partially hydrogenated donor diluent solvent with said vacuum resid;

(b) subjecting said combined vacuum resid and solvent to hydrogen donor diluent cracking under conditions at which at least 60 volume percent of the fraction of said resid boiling above 1,000° F. is converted to material boiling below 1,000° F.;

(c) combining the effluent from said donor diluent cracking step with quench material selected from the group consisting of cracked residuum, vacuum gas oil and mixtures thereof in an amount sufficient to substantially prevent coke formation at the donor diluent cracking furnace outlet;

(d) combining with said effluent from said donor diluent cracking step a cracked residuum in an amount of from 3 to 100 volume percent of said straight run vacuum resid; a part or all of which cracked residuum may have been utilized as the quench material in step (c);

(e) subjecting said effluent cracked residuum, quench material and cracked residuum to fractionation to produce distilled products and a fractionator bottoms stream;

(f) subjecting said fractionator bottoms stream to vacuum distillation to produce a residual product and a vacuum gas oil stream comprised in part of the aromatic components of said cracked residuum;

(g) subjecting at least a part of said vacuum gas oil stream to a catalytic hydrogenation step to produce a partially hydrogenated hydrogen donor diluent product;

(h) utilizing at least a part of said partially hydrogenated hydrogen donor diluent product as the solvent in step (a); and

(i) recovering distilled product streams and a 1,000° F.+ product stream in an amount of not more than the sum of 40 volume percent of the 1,000° F.+ material in said straight run vacuum resid and the 1,000° F.+ fraction of the cracked residuum.

4,604,186

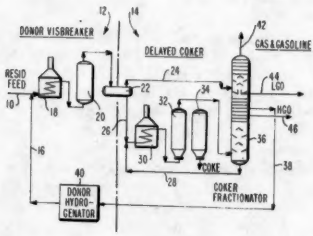
PROCESS FOR UPGRADING RESIDUUMS BY COMBINED DONOR VISBREAKING AND COKING

Irvin H. Lutz, and Thomas M. Wilson, both of Houston, Tex., assignors to DM International Inc., Tulsa, Okla.

Continuation of Ser. No. 617,502, Jun. 5, 1984, abandoned. This application Nov. 6, 1985, Ser. No. 795,713

Int. Cl.[4] C10G *55/04*

U.S. Cl. 208—50 **28 Claims**



1. A process for upgrading petroleum residuums to more valuable products comprising the steps of

mixing a hydrogenated aromatic donor fraction with the petroleum residuums to form a vis breaker feed;

donor visbreaking the visbreaker feed in a thermal visbreaker to crank heavy hydrocarbons into lighter products wherein the hydrogenated fraction in the visbreaker feed reacts to donate hydrogen to prevent formation of coke and reduce the quantity of coke precursors;

coking a coker feed including substantially all of the high boiling portion and substantially all of the aromatic donor fraction of the effluent from the visbreaker in a coker under nonpremium coker conditions to produce coke and overhead products whereby the reduction of coke precursors by the donor visbreaking reduces the quantity of coke product and increases the quantity of overhead productd;

fractionating the overhead products from the coker in a fractionater to produce one or more light product fractions, and an aromatic donor recycle fraction; and

hydrogenating the aromatic donor recycle fraction from the fractionator to form the hydrogenated donor formation for the visbreaker feed.

4,604,187

HYDROCRACKING WITH RARE EARTH-CONTAINING Y ZEOLITE COMPOSITIONS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 569,238, Jan. 9, 1984, Pat. No. 4,565,621, which is a division of Ser. No. 327,611, Dec. 4, 1981, Pat. No. 4,429,053. This application Jun. 3, 1985, Ser. No. 740,537

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.[4] C10G *47/18, 47/20, 65/12*

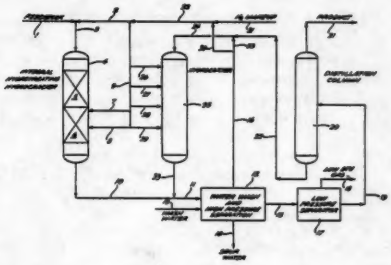
U.S. Cl. 208—59 **20 Claims**

1. A process for hydrocracking a hydrocarbon feedstock to produce a product of lower average boiling point which process comprises contacting said hydrocarbon feedstock with molecular hydrogen under ammonia-deficient hydrocracking conditions in the presence of a catalyst comprising an intimate mixture of a porous refractory oxide component and a type Y crystalline aluminosilicate zeolite containing a rare earth metal and a Group VIII hydrogenation metal, said zeolite having been prepared by a process comprising:

(a) cation-exchanging a type Y crystalline aluminosilicate zeolite with rare-earth containing cations;

(b) calcining the resultant rare earth-exchanged zeolite in the presence of water vapor at a water vapor partial pressure of a least about 0.2 p.s.i.a.;

(c) ion-exchanging the calcine zeolite from step (b) with ammonium ions; and



(d) ion-exchanging the ammonium-exchanged zeolite from step (c) with Group VIII metal-containing cations.

4,604,188

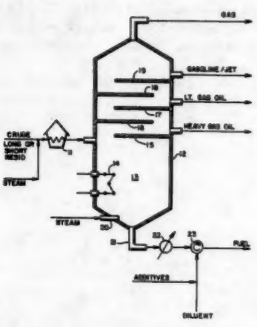
THERMAL UPGRADING OF RESIDUAL OIL TO LIGHT PRODUCT AND HEAVY RESIDUAL FUEL

Tsoung Y. Yan, Philadelphia, Pa., and Paul Shu, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 522,136, Aug. 11, 1983, abandoned. This application Jan. 16, 1985, Ser. No. 691,798

Int. Cl.[4] C10G *9/00*

U.S. Cl. 208—106 **24 Claims**



1. The method of upgrading residual oil boiling in the range of 1050° F.+ comprising:

thermally cracking said residual oil at a temperature of 650°–900° F., a pressure of 0–100 psig, and a residence time of 0.1 to 5 hours at the highest severity in the range between about 1,000–18,000 seconds, as expressed in equivalent reaction time at 800° F., sufficient to convert at least about 50 wt. % of the residual oil to light products, substantially without the formation of solid coke;

recovering separate fractions of light product and emulsifiable heavy bottom product which has a fusion temperature below about 150° C. and a quinoline-insoluble content between about 10 wt. % and 30 wt. % and wherein the highest severity is determined by a functional relationship between the asphaltene content of the residual oil feedstock and the heavy bottom product yield and quinoline-insoluble content in accordance with the followinng:

wt. % asphaltenes · $\frac{\text{wt \% quinoline} - \text{insolubles}}{\text{wt \% bottom product yield}}$ =

a value ranging between 6 and 12.

4,604,189

HYDROCRACKING OF HEAVY FEEDS WITH DISPERSED DUAL FUNCTION CATALYST

Francis J. Derbyshire, State College, Pa., and Philip Varghese, Voorhees, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,589

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.[4] C10G *47/20*

U.S. Cl. 208—111 **20 Claims**

19. In a process for hydroconverting a heavy natural or synthetic oil charge stock by reacting the oil with hydrogen in the presence of a solid, acidic catalyst after adding to the oil a thermally decomposable metal compound of a metal of Group IVB, VB, VIB, VIIB or VIII of the Periodic Table of Elements, the compound being added in an amount equivalent to 10 to 950 ppm, calculated as the elemental metal, based on the oil feed, the improvement comprising adding a zeolite having an alpha value of at least 1 and a Constraint Index of less than 1 without active metal on the catalyst, to the oil feed having a Conradson carbon content in excess of 1 weight percent, and hydroconverting the oil with the added acidic zeolite catalyst in a hydroconversion zone to convert at least 25 percent of the Conradsen carbon content to lighter materials to form an upgraded oil product.

4,604,190

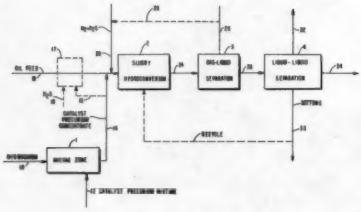
HYDROCRACKING WITH CHROMIC ACID AND AN ALIPHATIC POLYHYDROXY COMPOUND

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 728,485, Apr. 29, 1985, Pat. No. 4,567,167. This application Aug. 5, 1985, Ser. No. 762,764

Int. Cl.[4] C10G *47/12*

U.S. Cl. 208—112 **8 Claims**



1. A process for hydroconverting a hydrocarbonaceous oil chargestock to produce a hyroconverted hydrocarbonaceous oil product which comprises: reacting said hydrocarbonaceous oil chargestock with hydrogen at a hydrogen partial pressure ranging from about 50 to about 5000 psig, in the presence of a catalyst at hydroconversion conditions, including a temperature ranging from about 500° to about 1000° F., said catalyst having been prepared by the steps which comprise:

(a) adding a water soluble aliphatic polyhydroxy compound to an aqueous solution of chromic acid (CrO_3);

(b) introducing at least a portion of the mixture resulting from step (a) into said hydrocarbonaceous oil chargestock; and

(c) heating the mixture resulting from step (b) in the presence of a hydrogen sulfide-containing gas at conditions to produce a slurry comprising a solid chromium-containing catalyst.

4,604,191

REMOVAL OF ARSENIC, VANADIUM, AND/OR NICKEL COMPOUNDS FROM PETROLIFEROUS LIQUIDS

Richard H. Fish, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 597,627, Apr. 6, 1984, Pat. No. 4,518,490, Division of Ser. No. 699,886, Feb. 8, 1985, Pat. No. 4,552,854. This application May 17, 1985, Ser. No. 735,228

The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.

Int. Cl.[4] C10G *25/00*

U.S. Cl. 208—251 R **11 Claims**

1. Process comprising removing contaminant containing at least one of the group of arsenic, vanadium and nickel from petroliferous liquids by contacting said liquid at an elevated temperature of at least about 20° C. with a polystyrene-divinylbenzene polymer crosslinked with up to about 20% divinylbenzene and which polymer contains up to about 30% by weight of catechol ligands.

4,604,192

POWDER CLASSIFIER

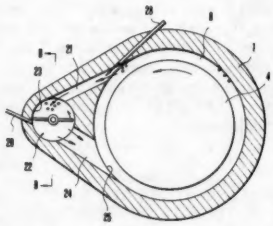
Yukiyoshi Yamada; Shin Doi, both of Saitama, and Masayuki Yasuguchi, Kanagawa, all of Japan, assignors to Nisshin Flour Milling Co., Ltd. and Nisshin Engineering Co., Ltd., both of Tokyo, Japan

Filed May 10, 1984, Ser. No. 609,094

Claims priority, application Japan, May 18, 1983, 58-87327; Apr. 16, 1984, 59-76383

Int. Cl.[4] B07B *7/083*

U.S. Cl. 209—144 **5 Claims**



1. In a powder classifier having:

a horizontally rotating turbine-like classifying rotor with an outer circumference;

a circular passage encompassing the outer circumference of the rotor and having the classifying rotor centered therein; and

an inlet means, positioned above the classifying rotor in the circular passage, for feeding powder thereinto, said powder having a coarse portion and a fine portion;

an improvement comprising:

duct means, connected at one end to the circular passage and extending therefrom in a direction approximately tangential to the circular passage, for discharging a flow of air, the coarse portion of the powder, and the fine portion of the powder from the classifying rotor;

means, connected at an opposite end of the discharging duct means, for precipitating the coarse portion of the powder from the flow of the air and the fine portion of the powder; and

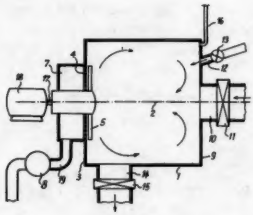
duct means, connected at one end to the precipitating means and connected at an opposite end to the circular passage, for recirculating the flow of the air and the fine portion of the powder to the classifying rotor.

4,604,193

METHOD AND APPARATUS FOR SORTING OUT A MIXTURE OF PAPER PULP AND CONTAMINANTS

Jean-Pierre J. Lamort, Saint Lumier en Champagne, France, assignor to E et M Lamort S.A., France

Filed Mar. 23, 1984, Ser. No. 592,525
Claims priority, application France, Mar. 25, 1983, 83 04929
Int. Cl.[4] B07B *1/04*
U.S. Cl. 209—273 **5 Claims**



1. A batch processing device for washing and separating contaminants from a mixture including paper pulp comprising:

a container having an approximately horizontal axis and first and second opposed ends, said horizontal axis running through said ends, said container further having upper and lower sides;

an approximately vertical wall having perforations therein disposed at said first end;

a stirrer for sitrring said mixture without shredding said paper pulp, disposed inside said container, and in front of said perforated wall, said stirrer including blades in a shape of a spiral, said blades roatating in a plane parallel to said plate a short distance therefrom, said blades having a hydrodynamic foil profile adapted for generating a depression in front of said perforated wall upon rotational passage of said blades at each passing of the blades, and having a leading edge shaped as a Bernouli spiral with a constant angle of 30°;

said pulp container further having a pulp inlet means coupled to a valve and disposed in said second end for conducting pulp into said container;

a chamber for the recovery of paper pulp, located across said perforated wall from said stirrer;

a pump, coupled to said chamber, for withdrawing material therefrom;

water inlet means coupled to a valve and coupled to said container for directing water thereinto;

vent means coupled to said container for allowing air into said container; and

an opening disposed in said lower side of said container, coupled to a valve for the removal of said contaminants from said container.

4,604,194

WATER CONDITIONER VALVE AND SYSTEM

Melvin E. Entingh, 3249 Dryden Rd., Dayton, Ohio 45439

Filed Dec. 4, 1984, Ser. No. 678,601
Int. Cl.[4] C02F *1/44*
U.S. Cl. 210—98 **5 Claims**

1. A water conditioner system for producing product water from supply water received from a water supply source, comprising:

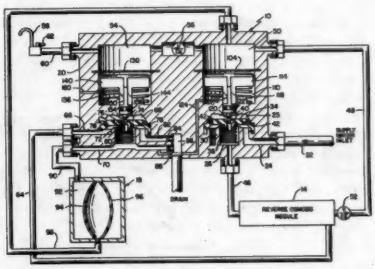
water filter means, the water filter means including means for receiving supply water and means for producing and discharging product water and for discharging brine water, the water filter means having a water supply inlet passage and a product water outlet passage and a brine water outlet passage,

a water container, a movable wall within the water container and separating the water container into a first portion and a second portion,

a product water outlet conduit, the product water outlet conduit being operable and closeable, the product water outlet conduit being normally closed,

a valve housing, the valve housing being provided with a water supply inlet passage and a water supply outlet passage, there being a first cavity within the housing and joining the water supply inlet passage to the water supply outlet passage, a first valve within the first cavity and positioned to control flow of water between the water supply inlet passage and the water supply outlet passage, spring means urging the first valve to an open position, the first valve being provided with a main orifice therethrough and an auxiliary orifice therethrough, a first closure member, the first closure member being movable into the main orifice to close the main orifice of the first valve,

the housing also being provided with a third passage and a fourth passage, there being a second cavity leading from the third passage to the fourth passage, a second valve within the second cavity and positioned to control water flow between the third passage and the fourth passage, spring means urging the second valve to an open position, the second valve being provided with a main orifice and an auxiliary orifice,



the housing also being provided with a fifth passage and a sixth passage, a check-valve separating the fifth and sixth passages, means joining the sixth passage to the product water outlet conduit,

first piston means, means responsive to product water pressure in the fifth passage for operation of the first piston means, means responsive to operation of the first piston means for operation of the first closure member,

second piston means, means responsive to pressure of product water in the sixth passage for operation of the second piston means, means responsive to operation of the second piston for controlling operation of the second closure member,

first conduit means, the first conduit means joining the water supply outlet passage of the housing to the water supply inlet passage of the water filter means, second conduit means, the second conduit means joining the product water outlet passage of the water filter means to the fifth passage of the housing, third conduit means, the third conduit means joining the brine water outlet passage of the water filter means to the third passage of the housing,

fourth conduit means, the fourth conduit means joining the fifth passage of the housing to the second portion of the water container, fifth conduit means, the fifth conduit means joining the first portion of the water container to the fourth passage of the housing,

wherein supply water flows into the water supply inlet

passage of the housing and supply water flows through the first cavity into the supply water outlet passage and from the supply water outlet passage through the first conduit means to the water filter means, product water flowing from the product water outlet passage of the water filter means through the second conduit means to the fifth passage of the housing, product water flowing from the fifth passage into the fourth conduit means and into the second portion of the water container, product water also flowing from the fifth passage into the sixth passage and into the product water outlet conduit,

the product water when sufficient in volume and pressure operating the second piston and moving the second closure member into the main orifice of the second valve to close the main orifice of the second valve, wherein water flow through the auxiliary orifice within the second cavity forces the second valve to close communication between the third passage of the housing and the fourth passage of the housing, thus preventing flow of brine water to the water container, increased pressure of the product water in the fifth passage operating the first piston and moving the first closure member into the main orifice of the first valve to close the main orifice of the first valve member, wherein water flow through the auxiliary orifice in the first valve within the first cavity forces the first valve to close communication between the first passage and the second passage, thus preventing water flow from the water supply source to the water filter means,

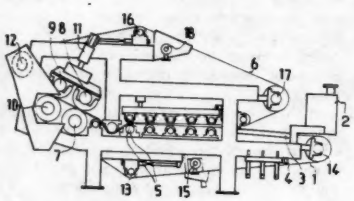
opening of the product water outlet conduit permitting flow of product water from the water container and from the fifth and sixth passages and reducing the pressure of product water within the fifth and sixth passages, wherein the first and second pistons operate and move the first and second closure members from the first and second valves, permitting the first and second valves to move to open position and permit flow of supply water through the water supply inlet passage and through the supply water outlet passage and into the water filter means, for additional flow of brine water from the water filter means and into the first portion of the water container thus applying pressure upon the movable wall within the water container and forcing product water to flow from the water container and through the fifth and sixth passages and into the product water outlet conduit.

4,604,195

FILTER PRESS FOR THICKENING CELLULOSE PULP OR SLUDGE

Tuomo Lintunen, Savonlinna, Finland, assignor to Enso-Gutzeit Oy, Helsinki, Finland

Filed Apr. 23, 1984, Ser. No. 603,136
Claims priority, application Finland, Apr. 22, 1983, 831387
Int. Cl.[4] B01D *33/04*
U.S. Cl. 210—131 **9 Claims**



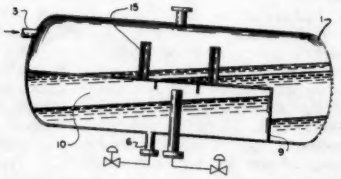
1. A filter press for thickening a material by removing liquid from the material, the press comprises a wire unit including a pair of oppositely disposed filtercloths in closely spaced relation and forming a passage therebetween having an inlet end and an outlet end for conducting a web of the material to be thickened through the press, and wall means for forming a feedbox for directing the material to be thickened into the inlet end of the wire unit, the feedbox comprises an elongated throat separate from said wire unit and arranged within said feedbox and having a feed direction for passing the material through the feedbox into the wire unit inlet end, said throat comprises a plurality of surfaces extending in the feed direction of the material and defining the cross-section of said throat transverse of the feed direction, at least one of said surfaces extending in the feed direction and between said wall means being perforate for removing liquid from the material passing through the throat and directing the liquid into the feedbox for thickening the material passing through the throat before it is passed into the inlet end of the wire unit of the filter press, said perforate surface having a water penetration capacity much higher than said filtercloths and at least one of said surfaces forming said throat being pivotally mounted in said feedbox for movement relative to the other surfaces of said throat for varying the size of the transverse cross-section of said throat.

4,604,196

MARINE SEPARATOR FOR FLUIDS OF DIFFERENT DENSITIES

Neely E. Lowrie, Tulsa, and Mitchel L. Rooker, Sand Springs, both of Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 16, 1985, Ser. No. 755,520
Int. Cl.[4] B01B *17/028*
U.S. Cl. 210—136 **7 Claims**



1. A separation system for a plurality of fluids having different densities and subject to marine motions, including,

a cylindrical separator vessel extending horizontally and having an inlet to receive a plurality of fluids having different densities,

a substantially flat and horizontal table/baffle mounted internally and extended a major length of the vessel and parallel the vessel axis to receive and spread the fluids from the inlet to a well formed at one end of the vessel by a substantially vertical plate sealed to the table and extending down to the bottom of the vessel,

a liquid-packed compartment formed between the underside of the table and substantially vertical plate and the lower wall of the vessel,

at least one check valve mounted through the vertical plate between the well and the compartment to allow one-way flow of at least one fluid into the compartment from the well,

an outlet conduit through the table communicating the compartment to the area above the table for the removal of the fluid of lesser density from the compartment,

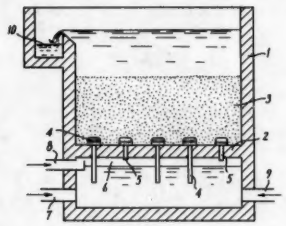
outlets from the compartment near the center of the compartment length for the separated fluids having the greater density,

and an outlet through the vessel wall above the table for the fluid having the lessor density.

4,604,197
SUBMERGED FILTER FILLED WITH GRANULAR MATERIAL

Robert Louboutin, Crespières, and Jean Gibaud, Paris, both of France, assignors to Degremont, Hauts de Seine, France

Filed Dec. 28, 1984, Ser. No. 687,427
Claims priority, application France, Jan. 2, 1984, 84 00008
Int. Cl.[4] C02F *3/06*; B01D *23/20*
U.S. Cl. 210—150 **3 Claims**



1. A submerged filter comprising:

a container having a bottom and a floor positioned above said bottom, said bottom and floor defining a chamber;

a filter mass comprising granular material supported by said floor within said container, liquid to be treated and treating gas passing upwardly through said filter mass during normal operation of said filter, and washing water and gas passing upwardly through said filter mass during a washing operation thereof;

means for introducing liquid to be treated into said chamber during said normal operation;

means for introducing washing water into said chamber during said washing operation;

means for introducing into said chamber gas at a first flow rate as said treating gas during said normal operation and at a second flow rate greater than said first flow rate as said washing gas during said washing operation;

a plurality of first nozzles extending through said floor and leading from said chamber to said granular material, each said first nozzle including first opening means for, during said normal operation, passing said liquid to be treated from said chamber into said granular material and for, during said washing operation, passing said washing gas from said chamber into said granular material, and each said first nozzle further including second opening means for, during said normal operation, passing said liquid to be treated from said chamber into said granular material and for, during said washing operation, passing said washing water from said chamber into said granular material;

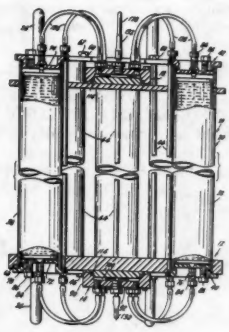
a plurality of second nozzles extending through said floor and leading from chamber to said granular material for, during said normal operation, passing said treating gas from said chamber into said granular material, each said second nozzle comprising a tube extending through and above said floor and having a passage, a cup-shaped member above said floor and covering an upper end of said tube, and openings extending through said cup-shaped member; and

said second nozzles having means for, during said normal operation with said treating gas introduced into said chamber at said first flow rate, creating a gas cushion within said chamber below said floor sufficient to prevent said liquid to be treated from entering said second nozzles and to ensure that said first and second opening means of said first nozzles are maintained submerged in said liquid to be treated, and for, during said washing operation with said washing gas introduced into said chamber at said second flow rate, creating an increased size gas cushion within said chamber below said floor sufficient to prevent submerging of said first opening means of said first nozzles in said washing water, said cushion creating means comprising, for each said second nozzle, a restriction within said passage of said tube, said restriction defining a valve, and a valve member positioned above said seat and movable away therefrom by said gas passing upwardly through said tube.

4,604,198
MULTICARTRIDGE CHROMATOGRAPHY CARTRIDGE HOUSING

Nils Dailey; Vishva Rai, both of Wallingford; Kenneth Southall, Westerfield, and Timothy J. Webster, Norfolk, all of Conn., assignors to AMF Inc., White Plains, N.Y.

Filed May 18, 1984, Ser. No. 611,662
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **20 Claims**



1. A multicartridge housing for cylindrical chromatographic cartridges, each cartridge effective for the chromatographic separation of a fluid passing radially therethrough, said housing comprising:

support means;

a plurality of cartridge holders secured to said support means, each of said cartridge holders being structured and sized to surround a cartridge therein and a volume surrounding the cartridge, said volume in fluid communication with said cartridge for radial distribution of the fluid through the cartridge;

an inlet fluid manifold means for distributing the fluid being separated to each of said holders for passage of the fluid radially through the cartridges therein; and

an outlet fluid manifold means for consolidating the fluid from the holders after passage of the fluid radially through the cartridges therein.

4,604,199
FILTERING COLUMN

Kenzaburo Yoritomi, Chibashi, Japan, assignor to Suomen Sokeri Oy, Espoo, Finland

Filed Apr. 10, 1985, Ser. No. 721,792
Claims priority, application Japan, Apr. 12, 1984, 59-073299
Int. Cl.[4] B01D *23/18*
U.S. Cl. 210—293 **5 Claims**

1. A filtering column which comprises:

a bottom having reciprocally arranged peaks and troughs formed therein and spaced apart at constant intervals;

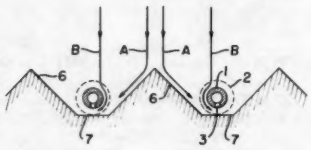
a plurality of branched pipes having small holes in their undersides uniformly therealong, said pipes lying in said troughs on the bottom;

filter means covering said respecting branch pipes said troughs having sides sloping downwardly to said respective branched pipes to afford smooth fluid flow thereto

and the sides of adjacent troughs intersecting to form said peaks;

gathering pipes connected to said branched pipes; and

an outlet connected to the gathering pipes said gathering pipes being connected to said branched pipes at locations such that the differences in the lengths of the flow courses from said branched pipes to said outlet are slight, such that a uniform flow rate is achieved without substantial backmixing.



4,604,200

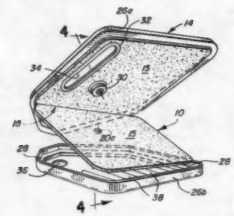
FLUID FILTER WITH UNIFORM SPACING

Ronald C. Machart, Jr., Oak Lawn, Ill., assignor to IGC, Inc., Bridgeview, Ill.

Filed Jun. 6, 1985, Ser. No. 741,751

Int. Cl.[4] B01D *27/06*

U.S. Cl. 210—314 **12 Claims**



1. A filter element for use in fluid filters which include a housing, for receiving the filter element in a folded condition, comprising a generally thin, flat body shaped for receipt within the housing defining two body portions when in said folded condition, said body having a fold line generally intermediate opposed ends thereof whereby the body is folded upon itself about said fold line in a substantially predetermined manner, and said fold line being formed by a double-line indentation comprising a pair of generally parallel fold lines to facilitate precise, substantially predetermined, folding and alignment of said opposed ends and generally uniform spacing of said body portions within said housing, providing improved fluid flow through the fluid filter.

4,604,201

FILTER

Hans Müller, Erlenbach, Switzerland, assignor to Dr. Müller AG, Männedorf, Switzerland

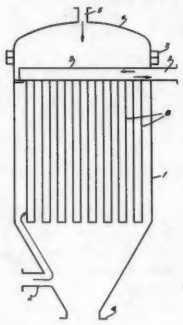
Continuation of Ser. No. 097,877, Nov. 27, 1979, abandoned, which is a continuation of Ser. No. 896,437, Apr. 14, 1978, abandoned. This application Aug. 3, 1981, Ser. No. 289,526

Claims priority, application Switzerland, Apr. 28, 1977, 5259/77; Nov. 15, 1977, 1390/77

Int. Cl.[4] B01D *23/00*

U.S. Cl. 210—323.2 **6 Claims**

1. A filter for hard substances-containing liquid, particularly an alluvial filter, comprising a pressure vessel, and a plurality of candle-like filter elements accommodated in said vessel and vertically suspended therein, each of said filter elements including a rigid supporting body having a hollow central tube extending along the elongation of said body, said central tube having a top end and a bottom end and being enclosed over the periphery thereof and open only at said top end and said bottom end, a plurality of peripheral rods surrounding said central hollow tube and forming a rounded periphery of said rigid body, and a plurality of transversal reinforcing elements extending between said central hollow tube and said peripheral rods and connecting the latter with the former, and a filter web extending over the periphery of said rigid body and the bottom thereof, so that during the filtration the liquid being filtered flows in a radial direction from the exterior of said filter elements inwardly through said filter web, the filtered liquid then enters said central tube of each filter element through the bottom end, flows in an axial direction within said hollow tube, and then leaves the respective central tube through the top end thereof, whereas during the backwashing the liquid being backwashed enters the respective hollow central tube of each of said filter elements through the top end thereof, flows in the axial direction in said hollow central tube, leaves said hollow central tube through the bottom end thereof and distributes between said hollow central tube and said filter web, and then flows in the radial direction from the interior of each of said filter elements outwardly through said filter web.



4,604,202

FILTER APPARATUS

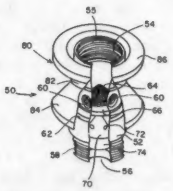
Avner Movshovitz, Tel Aviv, Israel, assignor to Amcor Ltd., Tel Aviv, Israel

Filed Dec. 26, 1984, Ser. No. 686,379

Claims priority, application Israel, Mar. 27, 1984, 71377

Int. Cl.[4] B01D *29/38, 35/22*

U.S. Cl. 210—409 **7 Claims**



1. Fluid filter apparatus which can be flushed in a controlled manner by a single longitudinal manual manipulation comprising:

a body member defining a fluid inlet and a fluid outlet which are separated along a longitudinal axis, the fluid outlet providing a fluid discharge along said longitudinal axis, and at least one flushing aperture disposed intermediate said fluid inlet and said fluid outlet;

filter means seated within said body member and disposed such that an upstream filter surface thereof lies adjacent and in communication with said at least one flushing aperture;

a manually adjustable flushing control cover member slidably mounted on said body member and arranged to have first and second operative orientations with respect thereto which are separated from each other along said longitudinal axis, and comprising a sleeve portion adapted for selectable sealing engagement with said at least one flushing aperture when said cover member is in a first operative orientation and a depending skirt portion arranged with respect to said sleeve portion such that when said cover member is in said second operative orientation and said sleeve portion lies above said at least one flushing aperture and out of sealing engagement therewith, fluid exiting from said at least one flushing aperture engages said skirt portion and is restricted to flow in a direction along said longitudinal axis;

said cover member being arranged to assume either said first orientation wherein said sleeve portion sealingly engages said at least one aperture, preventing fluid outflow therethrough, or said second orientation wherein said skirt portion lies in adjacent non-sealing relationship with said at least one aperture whereby substantially all fluid discharge from said aperture impinges on said skirt portion for being deflected thereby, such that at no position of said cover member relative to said body member, if fluid discharge from said fluid filter apparatus permitted other than along said longitudinal axis; and

manual engagement means for manual displacement of said cover member from said first orientation to said second orientation.

4,604,203

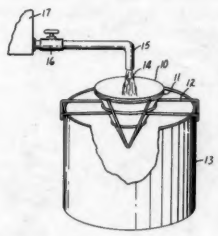
COOKING OIL FILTERING APPARATUS AND FILTER THEREFOR

Robert C. Kyle, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Co., Saint Paul, Minn.

Filed Sep. 14, 1984, Ser. No. 650,414

Int. Cl.[4] B01D *23/28*

U.S. Cl. 210—489 **7 Claims**



1. A cooking oil filtering apparatus especially suited for gravity filtration, said apparatus comprising a frame and a filter in the shape of a cone or a bag supported in said frame comprising an assembly of juxtaposed layers, as follows:

(a) an inside filter layer formed of a uniformly porous web comprising uniformly distributed, randomly interentangled, synthetic polymeric, blown micro-fibers that are less than 10 microns in diameter, said web having a weight in the range of about 30 to 47 g/m^2, a flow time to pass 200 ml of cooking oil of less than about 40 seconds, and a pressure drop of less than about 42 Pa, and

(b) an outside support layer of a highly porous, relatively stiff, light weight sheet material, more porous than said filter layer

wherein said layers are formed of materials which are resistant to thermal degradation and appreciable softening at normal cooking temperatures of said cooking oil and are disposed within said frame with said filter layer positioned to initially receive cooking oil passing through said layers.

4,604,204

POROUS, SEMIPERMEABLE MEMBRANES OF CHEMICALLY MODIFIED CELLULOSE ACETATE

Charles Linder, Rehovot, and Mordechai Perry, Petach Tikvah, both of Israel, assignors to Aligena AG, Basel, Switzerland

Continuation of Ser. No. 190,524, Sep. 18, 1980, abandoned. This application Nov. 23, 1983, Ser. No. 554,881

Claims priority, application Switzerland, Sep. 19, 1979, 8460/79

Int. Cl.[4] B01D *13/04*

U.S. Cl. 210—490 **19 Claims**

1. A porous, modified cellulose acetate membrane having a structure suitable for ultrafiltration and reverse osmosis, said membrane being prepared by a sequence of chemical reactions consisting essentially of steps (1) to (3), wherein:

step (1) is reacting (a) a cellulose acetate containing membrane having a pore diameter in the range of from 10 to 1000 Å, with (b) an organic compound which contains at least one group (b_1) capable of reaction with hydroxyl groups of the membrane (a), and at least one group (b_2) capable of reaction with component (c), to bond the hydroxyl groups to a group (b_1), such that a membrane obtained from step (1) has at least one reactive group (b_2),

step (2) is reacting group (b_2) of said membrane with (c) a polyfunctional linear or branched polymer containing functional groups (c_1) and (c_2), to bond group (b_2) to group (c_1), and thereby introduce said polymer into said membrane, and

step (3) is reacting (d) a compound which contains at least one ionic group and at least one group (d_1) capable of reaction with group (c_2), provided that said polyfunctional linear or branched polymer (c) itself does not already possess sufficient ionic groups, to bond group (d_1) to group (c_2) to form a membrane containing said at least one ionic group.

4,604,205

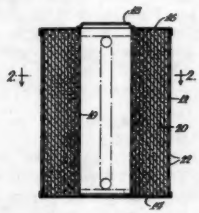
WATER REMOVING FILTER MEDIA

William R. Ayers, Bement, Ill., assignor to Central Illinois Manufacturing Company, Bement, Ill.

Continuation of Ser. No. 413,981, Sep. 2, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 671,061

Int. Cl.[4] B01D *15/00*

U.S. Cl. 210—497.2 **1 Claim**



1. A water absorbing, mechanical filter comprising:

a filter housing;

an inlet port in said housing;

an outlet port in said housing;

said housing further including means defining a liquid flowpath from said inlet port to said outlet port;

a body of fibrous material within said housing and extending across said flowpath; and

a quantity of starch-polyacrylonitrile graft copolymer dispersed throughout and fixed to said body, the distribution

of the graft copolymer within said body being greater nearer said outlet port than said inlet port.

4,604,206

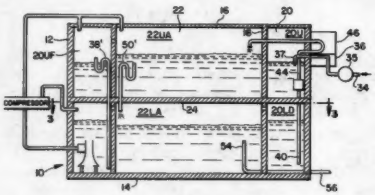
STAGED ANAEROBIC REACTOR

Richard A. Sullivan, Brookfield, Wis., assignor to Envirex Inc., Waukesha, Wis.

Division of Ser. No. 546,800, Oct. 31, 1983, Pat. No. 4,568,457. This application Oct. 2, 1985, Ser. No. 782,823

Int. Cl.[4] C02F *3/28*

U.S. Cl. 210—603 **10 Claims**



1. A method of anaerobically digesting organic substances in wastewater, comprising:

establishing an acid forming microorganism colony on a first large surface area RBC in a first closed chamber;

establishing and maintaining the temperature, pH, and nutrient conditions for at least 80% of the growth rates of said acid forming microbes in said first closed member;

submerging and rotating said RBC in said wastewater at a rotational speed and a level between 10–90% submerged, selected for optimal gas/liquid and liquid/biota contact, to obtain the optimal CO_2 solution and liquid turbulence at the biota cell wall, and rotating said RBC about its axis;

isolating and compressing the off-gasses produced by said acid forming microbes, and utilizing at least a portion of said compressed off gasses to mix said wastewater and to adjust the pH of said wastewater by a controlled supply of said off-gasses to locations submerged in said wastewater;

establishing a methane forming microorganism on a second large surface RBC in a second closed chamber in liquid communication with said first closed chamber;

establishing and maintaining the optimum temperature, pH, and nutrient conditions for maximal growth rates of said methane forming microorganism in said second chamber;

submerging and rotating said second RBC in said wastewater at a rotational speed and a level between 10–90% submerged, selected to approach optimal gas/liquid and liquid/biota contact to obtain the optimal methane off-gassing and liquid turbulence at the biota cell wall;

isolating, collecting, and compressing the methane gas produced by said methane forming microbes for commercial or industrial utilization.

4,604,207

PACKING MATERIALS FOR CHROMATOGRAPHIC USE AND A METHOD FOR ANALYSIS OF AN ENANTIOMER MIXTURE USING THE SAME

Naobumi Oi, Kyoto; Tadashi Doi, Toyonaka, and Masayuki Nagase, Suita, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

PCT No. PCT/JP83/00145, § 371 Date Jan. 18, 1984, § 102(e) Date Jan. 18, 1984, PCT Pub. No. WO83/04103, PCT Pub. Date Nov. 24, 1983

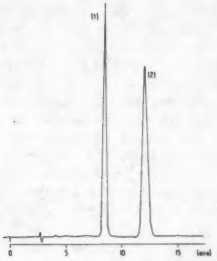
PCT Filed May 18, 1983, Ser. No. 585,825

Claims priority, application Japan, May 19, 1983, 57-85496

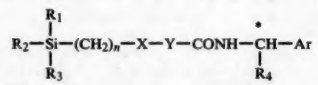
Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—635 **10 Claims**

1. A packing material for chromatographic use which comprises an inorganic carrier having hydroxyl groups at the surface thereof having grafted thereon an α-arylalkylamine derivative which is formed by bonding an optically active α-arylalkylamine and an aminoalkylsilane through a dibasic carboxylic acid,



wherein the grafted α-arylalkylamine derivative is an organosilane represented by general formula (I):



(I)

wherein R_1, R_2 and R_3 each, which may be the same or different, is an alkyl group, an alkoxyl group, a hydroxyl group or a halogen atom, with proviso that at least one thereof is an alkoxyl group or a halogen atom; R_4 is an alkyl group; Ar is a naphthyl group, which may be substituted; X is —NHCO— or $—N^{\oplus}H_3.O^{\ominus}CO—$; Y is a lower alkylene group or a phenylene group; n is an integer of from 2 to 4; and * indicates an asymmetric carbon atom.

4,604,208

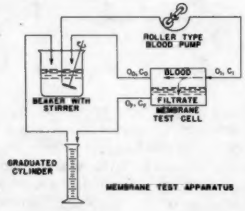
LIQUID FILTRATION USING AN ANIONIC MICROPOROUS MEMBRANE

Chaokang Chu, 114 Manor Cir., E. Hartford, Conn. 06118; Joseph V. Fiore, 205 Steiner St., Fairfield, Conn. 06430; Rodney A. Knight, 147 Lane Oak Dr., New Milford, Conn. 06776; Paul J. Marinaccio, 107 Forest Rd., Monroe, Conn. 06468, and Asit Roy, 55 Carpenter Rd., Manchester, Conn. 06040

Filed Dec. 29, 1983, Ser. No. 566,764

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—636 **18 Claims**



1. A process for filtration of liquid having cationic particulate contaminants therein, comprising passing the liquid through a skinless hydrophilic anionic charge modified microporous filter membrane comprising:

a skinless hydrophilic organic polymeric microporous filter membrane having an internal microstructure throughout said membrane, and

a charge modifying amount of an anionic charge modifying agent bonded to substantially all of the membrane micro-

structure without substantial pore size reduction or pore blockage, wherein the charge modifying agent is a water soluble polymer having substituents thereon capable of bonding to the membrane and anionic functional groups, wherein the anionic functional groups are selected from the group consisting of carboxyl, phosphonous, phosphonic, sulfonic groups or mixtures thereof and modify the zeta potential of the membrane,

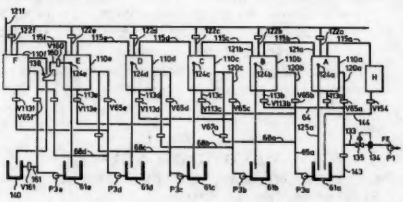
whereby the cationic particulate contaminants are captured by the anionic charge modified microporous membrane and substantially removed from the liquid.

4,604,209

PROCESS FOR LIQUID-SOLID CONTACTING

Alexander Himsley, 250 Merton Street, Toronto, Ontario, Canada M4S 1B1

Filed Oct. 24, 1984, Ser. No. 664,741
Int. Cl.[4] B01J *47/10*
U.S. Cl. 210—661 **13 Claims**



1. Process for the continuous contacting of pregnant liquid with absorbent particles contained in a series of horizontally adjacent vessels, wherein normally an incoming pregnant liquid is flowed in a continuous series stream passing upwardly through each vessel in series, whereby the particles are fluidized and receive a loading from the pregnant liquid, and, periodically, the loaded particles from a vessel at the end of said vessel series receiving the incoming pregnant liquid is removed from said end vessel, and a transfer of particles is effected between adjacent vessels in a direction counter-current to the pregnant liquid stream, the batch of loaded particles removed from said end vessel is stripped of its loading, and an initial vessel in the series is replenished with the stripped batch of particles, characterized in that each vessel has its side surfaces converging downwardly adjacent its lower end to a collection zone, and has a particle collection conduit having its inlet opening adjacent the collection zone and extending upwardly and transversely to its outlet in the vessel next adjacent in said counter-current direction, and said particles transfer is effected from each vessel to the next, which at such time is substantially empty of particles, by diverting said series stream to by-pass the vessel from which particles are to be transferred, and to flow to the vessel next adjacent in the co-current direction of the stream, and particles are transferred in a slurry by withdrawing liquid from the vessel next adjacent in the counter-current direction to the vessel which is to receive the particles, and flowing it into the collection zone of the vessel from which particles are to be transferred and up the particle collection conduit and into a lower region of the vessel which is to receive the particles, while withdrawing liquid from the upper region of the vessel which is to receive the particles, until substantially all the particles have been slurried from one vessel to the next.

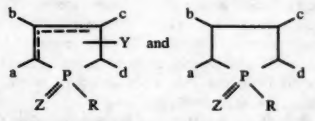
4,604,210

METHOD FOR REMOVING CYCLIC PHOSPHORUS CONTAMINANTS FROM ORGANIC SUBSTRATES

Chung-Yuan Lin, Northford, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 25, 1985, Ser. No. 727,178
Int. Cl.[4] B01D *15/04*
U.S. Cl. 210—690 **11 Claims**

1. A method for removing a cyclic phosphorus contaminant selected from those having the formulae:



(I) (II)

wherein

a, b, c, and d in each instance are independently selected from the group consisting of hydrogen, halogen, lower-alkoxy, phenoxy, lower-hydrocarbyl and halo-substituted lower-hydrocarbyl; the dotted lines represent a double bond between carbon atom 3 and one of the carbon atoms 2 and 4; Y is hydrogen attached to whichever of carbon atoms 2 and 4 is not part of said double bond; R is selected from the group consisting of lower-hydrocarbyl and halo-substituted lower-hydrocarbyl, and Z is selected from the class consisting of oxygen and sulfur

from a fluid or fluid mixture selected from the group consisting of an organic liquid, an organic solid dissolved in an organic liquid, an mixtures of any of the foregoing, said method comprising contacting the fluid or fluid mixture with a cation exchange resin insoluble therein at a temperature of from about 20° C. to about 100° C. and thereafter separating said exchange resin from said fluid or fluid mixture.

4,604,211

ACRYLIC ACID-SODIUM VINYLSULFONATE-VINYL ACETATE TERPOLYMER AND USE THEREOF AS A DISPERSANT

James F. Kneller, LaGrange Park, and John R. Hurlock, Hickory Hills, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

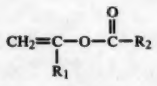
Filed Jan. 29, 1985, Ser. No. 696,227
Int. Cl.[4] C02F *5/10*
U.S. Cl. 210—701 **10 Claims**

1. A method for dispersing organic and inorganic constituents including iron oxide in industrial water systems which comprises adding to said water systems an effective dispersive amount of a water-soluble terpolymer comprising in percentages by weight:

A. 40–90 percent acrylic acid;

B. 5–40 percent sodium vinyl sulfonate, and,

C. 5–40 percent of a monomer having the formula:



wherein,

R_1=H, CH_3

R_2=C_1–C_7 alkyl;

said terpolymer having a molecular weight of from 1,500 to 100,000.

4,604,212
USE OF COPOLYMERS OF CARBOXYLIC MONOMER AND BETAINE-CONTAINING MONOMER AS CORROSION AND SCALE INHIBITORS

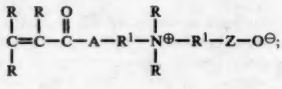
Gary F. Matz, Revere, Mass., assignor to Calgon Corporation, Pittsburgh, Pa.

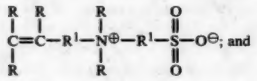
Division of Ser. No. 601,892, Apr. 19, 1984, abandoned. This application May 16, 1985, Ser. No. 734,942
Int. Cl.[4] C02F *5/12*
U.S. Cl. 210—700 **6 Claims**

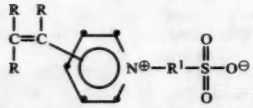
1. A process for inhibiting corrosion and the formation and deposition of scale in aqueous systems, comprising adding to the system at least 0.1 ppm of a water-soluble polymer having an intrinsic viscosity of 0.05 to 2.5 dl/g prepared from:

(A) 50 to 95%, by weight, of an unsaturated carboxylic acid selected from the group consisting of acrylic acid and methacrylic acid, or its salt, and

(B) 5 to 50% by weight, of a betaine-containing monomer selected from the group consisting of:


(i)


(ii)


(iii)

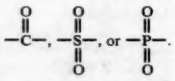
wherein

R, which may be the same or different, is hydrogen, a straight or branched, alkyl or an aryl or alkylaryl group of from 1 to 20 carbon atoms;

R^1, which may be the same or different, is a saturated, straight or branched alkyl group of from 1 to 5 carbon atoms;

A is NH or O; and

Z is



4,604,213
POLYMERS OF 1-ACRYLOYL-4-METHYL PIPERAZINE, METHYL CHLORIDE OR SULFATE QUATERNARY SALTS AS FLOCCULANTS

Dodd W. Fong, Naperville, and Ann M. Halverson, Wheaton, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 8, 1985, Ser. No. 720,848
Int. Cl.[4] C02C *1/56*; B01D *21/01*
U.S. Cl. 210—735 **6 Claims**

1. A method of flocculating suspended solids from aqueous industrial wastes which comprises treating said wastes with a small, yet effective, amount of a water-soluble polymer which contains at least 50 mole percent of either the dimethyl sulfate or the methyl chloride quaternary ammonium salt of 1-acryloyl-4-methyl piperazine, which polymer has an intrinsic viscosity greater than 0.5.

4,604,214
REMOVAL OF NITROCRESOLS FROM DINITROTOLUENE WASTE STREAMS USING FENTONS REAGENT

Richard V. C. Carr, Allentown, Pa.; Carl J. Martin; Roland Gonzalez, both of Houston, Tex., and Thomas A. Albanese, Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 16, 1985, Ser. No. 766,849
Int. Cl.[4] C02F *1/72*
U.S. Cl. 210—759 **10 Claims**

1. In a process for removing trinitrocresol material produced in the nitration of aromatic compounds by the mixed acid technique to produce a nitroaromatic compound, the improvement which resides in

(a) contacting the resultant crude nitroaromatic product with an alkaline material to convert trinitrocresol material therein to a water soluble salt, and thereby form a purified nitroaromatic organic product and an aqueous by-product phase containing the alkali metal salt of trinitrophenolic material,

(b) separating the aqueous phase from the organic phase,

(c) contacting the aqueous phase containing water soluble trinitrocresol material with an acid, said acid being added in sufficient proportion to reduce the pH to a range from about 2–4.5;

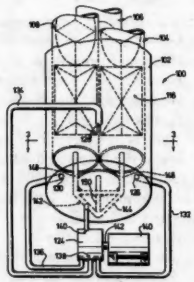
(d) contacting the aqueous phase at reduced pH with hydrogen peroxide and a ferrous ion under conditions to effect oxidation of the trinitrocresol material to carbon dioxide, nitric acid and carboxylic acid; and

(e) disposing of said aqueous phase containing resultant oxidized trinitrocresolic material.

4,604,215
WET OXIDATION SYSTEM

Robert P. McCorquodale, West Hill, Canada, assignor to Kenox Corporation, Toronto, Canada

Filed Apr. 2, 1984, Ser. No. 595,821
Int. Cl.[4] C02F *11/08*
U.S. Cl. 210—762 **16 Claims**



1. A process for oxidizing an aqueous suspension of organic matter at elevated temperature and pressure by exposing the organic matter to an oxygen-containing gas in a reactor for a period sufficient to reduce chemical oxygen demand of the organic matter to a predetermined desired level, said reactor having a reactor core housing a static mixer vane arrangement and means for circulating said aqueous suspension of organic matter over said static mixer vane arrangement within said reactor core, said static mixer vane arrangement comprising an arrangement of vanes extending along a majority of and within said reactor core, said process comprising operating said reactor at said elevated temperature and pressure which promotes the oxidation in the aqueous medium of organic matter with minimal generation of steam, introducing an oxygen-contain-

ing gas into said aqueous suspension of organic matter; splitting, rearranging and combining the aqueous suspension of organic matter and bubbles of oxygen-containing gas by the aqueous suspension of organic matter and bubbles of oxygen containing gas over said arrangement of vanes within said reactor core to react said organic matter with said oxygen; withdrawing treated organic matter from said reactor.

4,604,216

DRILLING FLUIDS

Howard B. Irvin; G. Allan Stahl, and Earl Clark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 435,175, Oct. 19, 1982. This application Jun. 11, 1984, Ser. No. 619,108

Int. Cl.[4] C09K *7/00*

U.S. Cl. 252—8.510 **37 Claims**

1. A method of preparing a composition suitable for use as a drilling fluid, comprising the steps of:

(a) copolymerizing a hydrophilic vinyl monomer selected from the group consisting of acrylic acid, methacrylic acid, other related monomers and mixtures of any two or more thereof with at least one hydrophobic vinyl monomer selected from the group consisting of acrylic acid esters, methacrylic acid esters, vinyl esters of saturated monocarboxylic acids having from 1 to 3 carbon atoms, and combinations of any two or more thereof under polymerization conditions in an inert low chain transfer organic liquid medium selected from the group consisting of n-hexane, cyclohexane and chlorofluorocarbons at a polymerization temperature and for a period of polymerization time sufficient to produce a copolymer having a weight average molecular weight in the range from about 100,000 to about 500,000;

(b) contacting said resulting copolymer in said inert, low chain transfer, organic liquid medium selected from the group consisting of n-hexane, cyclohexane and chlorofluorocarbons with an aqueous solution of sodium hydroxide which is present in a quantity sufficient to raise the pH of the subsequently dried copolymer salt in a polymer solution in water of at least about 1 weight percent concentration to a value in the range from about 5.3 to about 12 to produce the salt form of said resulting copolymer;

(c) drying the salt form of said resulting copolymer produced by step (b) to produce a dried copolymer salt;

(d) adding a quantity of the dried copolymer salt produced in accordance with step (c) to a quantity of a mixture comprising water and a clay substance suspended in said water; and

(e) mixing said dried copolymer salt, said water and said clay substance to produce a drilling fluid.

4,604,217

GELLED AQUEOUS COMPOSITIONS

Carl Lukach, and Shao-Tang Sun, both of New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Sep. 13, 1984, Ser. No. 650,386

Int. Cl.[4] E21B *43/26, 33/138*

U.S. Cl. 252—8.551 **16 Claims**

1. A gelled aqueous composition comprising fresh water or brine having a pH greater than 10 and

(a) a water thickening amount of (i) an anionic water soluble polymer selected from the group consisting of alkali metal salts of carboxymethyl cellulose, carboxymethyl hydroxyethylcellulose, carboxymethyl guar, carboxymethyl hydroxyethyl guar, carboxymethyl hydroxypropyl guar, xanthan gum and copolymers of sodium acrylate having a molecular weight of from about 50,000 to about 30,000,000 and from about 10% to about 90% acrylate content or (ii) a nonionic water soluble polymer selected from the group consisting of polyacrylamides having a molecular weight of from about 50,000 to about 30,000,000, polyacrylontrile having a molecular weight of from about 50,000 to about 30,000,000, polyvinylpyrrolidone having a molecular weight of from about 50,000 to about 30,000,000, copolymers of acrylamide having a molecular weight of from about 50,000 to about 30,000,000, hydroxyethyl cellulose, methyl cellulose, methylhydroxyethyl cellulose, ethylhydroxyethyl cellulose, hydroxypropyl hydroxyethyl cellulose, hydroxyethyl guar and hydroxypropyl guar, and

(b) a water soluble cationic poly(diallylamine)-epichlorohydrin resin having a molecular weight from about 100 to about 20,000,000 in an amount sufficient to cause a gel to form.

4,604,218

AQUEOUS ACID GELS AND USE THEREOF

Jeffrey C. Dawson, Katy, Tex., assignor to BJ-Titan Services Company, Houston, Tex.

Filed Mar. 28, 1985, Ser. No. 717,210

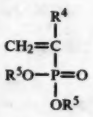
Int. Cl.[4] E21B *43/27*

U.S. Cl. 252—8.553 **4 Claims**

1. An aqueous acid gel useful in fracture acidizing of oil and gas wells, comprising:

an aqueous acid;

at least about 0.2 weight percent based upon the weight of aqueous acid of a copolymer of about 90 to 99 weight percent dialkyl diallyl ammonium halide, wherein the alkyl groups contain 1 to 4 carbon atoms, and about 1 to 10 weight percent of vinyl phosphonic acid of the formula



wherein R^4 is hydrogen or an alkyl radical containing 1 to 4 carbon atoms, R^5 is hydrogen or an alkyl radial containing 1 to 4 carbon atoms, and at least one of R^5 is hydrogen;

a cross-linking agent, present in a gelling amount, which is the reaction product of zirconium or titanium compounds with organic acids containing 1 to 12 carbon atoms, the cross-linking agent, calculated as ZrO_2 or TiO_2, being present in the range from 0.25 to 5.0 weight percent based on the weight of polymer; and

said gel further comprising a gel destabilizing amount of an acid soluble compound selected from the group consisting of compounds containing fluoride ions, alkali metal and alkaline earth metal phosphates and alkali metal and alkaline earth metal sulfates, said acid soluble compound being present in the range from about 1 to 10 weight percent, based on the weight of polymer.

4,604,219

METHOD OF PREPARING OVERBASED CALCIUM SULFONATES

Joanne R. Whittle, P.O. Box 1608, Port Arthur, Tex. 77641

Filed Apr. 25, 1985, Ser. No. 727,042

Int. Cl.[4] C10M *135/10*

U.S. Cl. 252—25 **5 Claims**

1. A process for preparing an overbased oil-soluble calcium sulfonate comprising in order:

(a) diluting a neutral calcium sulfonate with a light hydrocarbon solvent and a lower alkanol;

(b) mixing calcium oxide with the calcium sulfonate;

(c) heating the resulting mixture to about 100° F. to 170° F. at pressure of about 0 to 50 psig;

(d) introducing continuously over a time of about 60 to 240 minutes and at a uniform rate into the heated mixture gaseous carbon dioxide and liquid water in a molar ratio of water/calcium oxide of 0.1 to 1.2;

(e) adding a diluent oil;

(f) separating solids from the liquid; and
(g) stripping the solvent from the resulting liquid product.

4,604,220

ALPHA OLEFIN SULFONATES AS CONVEYOR LUBRICANTS

James H. Stanton, Grosse Ile, Mich., assignor to Diversey Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 15, 1984, Ser. No. 671,789
Int. Cl.[4] C10M *135/10*
U.S. Cl. 252—33.4 17 Claims

1. In a water-soluble lubricant concentrate of the type adapted to be admixed with water to form a lubricant for facilitating transportation of containers on a conveyor, the improvement comprising:
(a) C_{12} to C_{18} alpha olefin sulfonates and mixtures thereof in an amount ranging between about 5 to about 50 percent by weight of the concentrate; and
(b) a vehicle carrier for the sulfonate selected from the group consisting of water, a water-soluble solvent, or mixtures thereof present in an amount ranging between about 50 and about 95 percent by weight of the concentrate.

4,604,221

NITROGEN-CONTAINING ESTERS AND LUBRICANTS CONTAINING THEM

Charles P. Bryant, Euclid, and Harold M. Gerdes, Cleveland, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 395,786, Jul. 6, 1982, abandoned. This application Apr. 3, 1985, Ser. No. 718,837
Int. Cl.[4] C16M *145/00*
U.S. Cl. 252—51.5 A 50 Claims

1. A nitrogen-containing ester consisting essentially of a carboxy-containing interpolymer, said interpolymer having a reduced specific viscosity of from about 0.05 to about 1 and being derived from at least two monomers, one of said monomers being a low molecular weight aliphatic olefin or styrene and the other of said monomers being an alpha, beta-unsaturated aliphatic acid, anhydride or ester thereof, said nitrogen-containing ester being substantially free of tritratable acidity and being characterized by the presence within its polymeric structure of each of the following groups which are derived from the carboxy groups of said interpolymer:
(A) a carboxylic ester group, said carboxylic ester group having at least eight aliphatic carbon atoms in the ester radical, and
(B) a carbonyl-polyamino group derived from a polyamino compound having one primary or secondary amino group and at least one monofunctional heterocyclic amino group,
wherein the molar ratio of carboxy groups of said interpolymer esterified to provide (A) to carboxy groups of said interpolymer neutralized to provide (B) is in the range of about 85:15 to about 99:1.

4,604,222

STABLE FERROFLUID COMPOSITION AND METHOD OF MAKING AND USING SAME

Lucian Borduz, Nashua, and Kuldip Raj, Merrimack, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed May 21, 1985, Ser. No. 736,388
Int. Cl.[4] H01F *1/25*
U.S. Cl. 252—62.52 30 Claims

1. A stable ferrofluid composition which comprises:
(a) an organic liquid carrier;
(b) magnetic particles in an amount sufficient to provide magnetic properties to the ferrofluid composition; and
(c) a dispersing agent in an amount sufficient to disperse and stabilize the magnetic particles in the organic liquid carrier, which dispersing agent comprises:
a cationic surfactant composed of a cationic positively charged head portion and a long-chain tail portion, the long-chain tail portion compatible with or soluble in the organic liquid carrier, to provide a stable ferrofluid composition having an electrical resistivity of about 10^6 ohms-cm or less.

4,604,223

HEAT STORAGE MATERIAL

Michio Yanadori, Hachioji, and Seigo Miyamoto, Takahagi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,948
Claims priority, application Japan, May 20, 1983, 58-87411; Aug. 3, 1983, 58-141024
Int. Cl.[4] C09K *5/06*
U.S. Cl. 252—70 8 Claims

1. A heat storage material comprising magnesium chloride hexahydrate ($MgCl_2.6H_2O$), and a nucleator which is admixed with said magnesium chloride hexahydrate and which includes at least one substance selected from the group consisting of magnesium silicate (Mg_2SiO_4), sodium metasilicate (Na_2SiO_3), calcium silicate ($CaSiO_3.nH_2O$), silicon carbide (SiC), calcium carbonate ($CaCO_3$), and derivatives thereof, a total quantity of addition of said nucleator being in the range of 0.01 to 10 parts by weight, whereby said nucleator suppresses the degree of supercooling of the magnesium chloride hexahydrate while not causing decomposition of the magnesium chloride hexahydrate.

4,604,224

ZEOLITE CONTAINING HEAVY DUTY NON-PHOSPHATE DETERGENT COMPOSITION

Bao-Ding Cheng, Kendall Park, N.J., assignor to Colgate Palmolive Co., New York, N.Y.

Continuation of Ser. No. 702,863, Feb. 20, 1985, abandoned, which is a continuation of Ser. No. 659,863, Oct. 11, 1984, abandoned, which is a continuation of Ser. No. 530,428, Sep. 8, 1983, abandoned, which is a continuation of Ser. No. 32,749, Apr. 29, 1979, abandoned, which is a continuation of Ser. No. 785,473, Apr. 7, 1977, abandoned, which is a continuation of Ser. No. 640,794, Dec. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 467,688, May 7, 1974, abandoned. This application Jul. 8, 1985, Ser. No. 753,360
Int. Cl.[4] B01J *39/14;* C02F *1/42;* C11D *3/12, 11/00*
U.S. Cl. 252—91 1 Claim

1. The phosphate-free heavy duty synthetic organic detergent composition consisting of 9 percent sodium linear tridecylbenzene sulfonate, 1 percent fatty alcohol polyethoxy ethanol condensate having 14–15 carbon atoms in the fatty alcohol and 11 ethoxy groups in the polyethoxy ethanol moiety, 15 percent sodium silicate having an $Na_2O:SiO_2$ ratio of 1:2.35, 16 percent partially hydrated type 4A molecular sieve zeolite of about 6.4 to 8.3 microns in diameter, 16 percent sodium perborate tetrahydrate powder having a mesh size of from about 140 to 325 U.S. Standard Sieve Series, 1 percent sodium higher fatty acid soap prepared from a mixture of 4 parts by weight hydrogenated tallow oil and 1 part hydrogenated coconut oil, 0.5 percent sodium carboxymethyl cellulose, about 32 percent sodium sulfate, about 1 percent fluorescent brightener, about 1 percent of a mixture of washing dye, washing pigment, preservative and perfume, and about 6 percent moisture, said percents being weight percents relative to the total weight, wherein the sodium linear tridecylbenzene sulfonate, the sodium silicate, about 1 percent of the zeolite, the soap, the sodium carboxymethyl cellulose, the sodium sulfate, the brightener, the dye, the pigment and the preservative are in the form of spray-dried beads, the fatty alcohol polyethoxy ethanol condensate, and the perfume are absorbed into and coat the spray-dried beads, and about 15 percent of the zeolite and the sodium perborate tetrahydrate also are present as an overcoat on the spray-dried beads.

4,604,225

REFRACTORY OXIDE HOSTS FOR A HIGH POWER, BROADLY TUNABLE LASER WITH HIGH QUANTUM EFFICIENCY AND METHOD OF MAKING SAME

Yok Chen, Oak Ridge, Tenn., and Roberto Gonzalez, Madrid, Spain, assignors to The United States of America as represented by the Secretary of the Department of Energy, Washington, D.C.

Filed Jul. 3, 1985, Ser. No. 751,405

Int. Cl.[4] C09K *11/12*

U.S. Cl. 252—301.4 R **10 Claims**

1. A high power laser host material formed of a refractory oxide crystal characterized by high quantum efficiency and high thermal stability with a substantially complete depletion of hydrogen and containing sufficient oxygen anion vacancies to produce only F^+ luminescence when optically excited

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4,604,226

AEROSOL CORROSION INHIBITORS

Philip L. Bartlett, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 22, 1985, Ser. No. 714,811

Int. Cl.[4] C09K *3/00;* **A01N** *25/06;* **A61K** *47/00*

U.S. Cl. 252—389 A **6 Claims**

1. In an aerosol composition packaged in a tin-plated steel can containing an aqueous aerosol-dispersible medium and a propellant, the improvement which comprises the presence of the combination of:

15 wt % to 85 wt % of an amine neutralized phosphate ester selected from the group consisting of 2-ethylhexylamine salt of mixed mono- and di-isooctyl acid phosphate, tertiary C_{12-14} alkyl primary amine salt of mixed mono- and di-isooctyl acid phosphate, diethylamine salt of mixed mono- and di-butoxyethyl acid phosphate and 2-ethylhexylamine salt of mixed mono- and di-tridecyl acid phosphate, and

85 wt % to 15 wt % of a volatile amine selected from the group consisting of cyclohexylamine, morpholine, and isopropylamine

in an amount sufficient to prevent more than light corrosion to a tin-plated steel aerosol can containing said aerosol composition.

4,604,227

VAPOR PHASE AND SURFACE CONTACT RUST PREVENTIVE COMPOSITION

Joseph F. Anzenberger, Sr., New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 16, 1984, Ser. No. 672,043

Int. Cl.[4] C09K *3/00;* **C23F** *11/02, 11/16*

U.S. Cl. 252—389.2 **2 Claims**

1. A concentrate for imparting rust preventive properties to phosphate ester based functional fluids wherein the concentrate comprises an oil soluble calcium petroleum sulfonate ingredient, a liquid polyolester ingredient, and a vapor phase corrosion inhibiting amount of N-methylethanol amine.

4,604,228

CANDOLUMINESCENT MATERIAL AND ITS PREPARATION PROCESS

Anne-Marie Perroud, Meylan, and Alain Silvent, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 25, 1985, Ser. No. 705,006

Claims priority, application France, Mar. 2, 1984, 84 03304

Int. Cl.[4] F21H *3/00, 1/02;* **H01M** *2/10*

U.S. Cl. 252—492 **10 Claims**

1. A candoluminescent material comprising a mixture of finely divided oxides brought into the form of a net identical to a textile, wherein the molar composition of the oxide mixture is 75 to 90% zirconia, 5 to 20% yttrium oxide or calcium and yttrium oxides, 2 to 15% magnesia or magnesia and alumina, and 0.01 to 1% of one or more oxides selected from the group consisting of iron, manganese, praseodymium and cerium, and wherein when alumina is present, the amount of magnesia is at least 2%, and when calcium oxide is present, the amount of yttrium oxide is at least 4%.

2. The candoluminescent material of claim 1, wherein the molar composition of said oxide mixture is 75–90% zirconia, 5% yttrium oxide, 12% magnesia and 1% of a mixture of oxides of iron and cerium.

4. A process for the preparation of a candoluminescent material, comprising: impregnating a combustible textile material with a solution of zirconium, calcium or yttrium or a mixture thereof, aluminum or magnesium salts or a mixture thereof and one or more salts selected from the group consisting of iron, manganese, praseodymium, chromium and cerium, the concentration of the salts in the impregnation solution being such that it corresponds to obtaining a mixture of oxides having the following molar composition: 75 to 90% zirconia, 5 to 20% of yttrium oxide or calcium oxide and yttrium oxide, 2 to 15% of magnesia, or magnesia and alumina, and 0.01 to 1% of one or more oxides of iron, chromium, manganese, praseodymium and cerium, and subjecting the thus impregnated textile to combustion in order to eliminate the textile, thereby converting the salts into oxides distributed in the form of a net substantially corresponding to the original textile material.

4,604,229

ELECTRICALLY CONDUCTIVE FERROFLUID COMPOSITIONS AND METHOD OF PREPARING AND USING SAME

Kuldip Raj, Merrimack; Lucian Borduz, and Hanumaiah L. Gowda, both of Nashua, all of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Mar. 20, 1985, Ser. No. 713,757

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—510 **24 Claims**

1. An electrically conductive ferrofluid composition, which composition consists essentially of:

(a) a nonvolatile liquid carrier;

(b) colloidal-size single domain magnetic particles in an amount sufficient to provide magnetic properties to the ferrofluid composition;

(c) colloidal-size electrically conductive carbon particles in an amount sufficient to provide electrical conductive properties to the ferrofluid composition; and

(d) a dispersing agent in an amount sufficient to disperse and stabilize the colloidal magnetic and electrically conductive carbon particles in the liquid carrier.

4,604,230

THERMALLY STABLE ADHESIVE

Jagadish C. Goswami, New City, N.Y.; Joseph A. Aurichio, Anderson, S.C., and Joseph R. Zingaro, Fairfield, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 15, 1984, Ser. No. 660,593

Int. Cl.[4] H01B *1/02*

U.S. Cl. 252—514 **97 Claims**

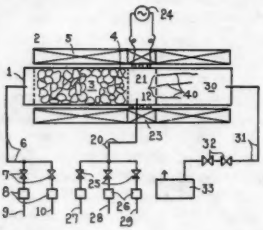
1. An adhesive composition comprising: (a) a soluble polyimide resin; (b) an appropriate solvent for said polyimide resin; (c) a tackifier; (d) an epoxy resin; (e) a hardener for said epoxy resin; (f) a catalyst which accelerates the curing of said epoxy resin; (g) a cross-linking agent reactive with the polyimide solvent of (b); (h) a catalyst which catalyzes the cross-linking reaction of (b) and (g); and (i) a filler material.

4,604,231

SILICON FIBER AND METHOD OF MAKING THE SAME

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Setagaya, Japan

Filed Sep. 5, 1984, Ser. No. 647,544
Claims priority, application Japan, Sep. 5, 1983, 58-162795
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—518 **5 Claims**



1. A silicon fiber which has a structure expressed by $(SiF_2)_n$ where $n>1$.

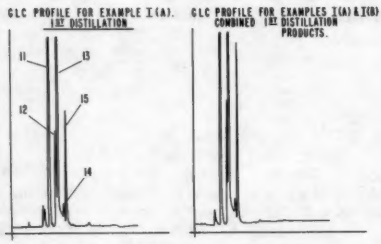
2. A silicon fiber according to claim **1**, which has a region doped with a P- or N-type impurity.

4,604,232

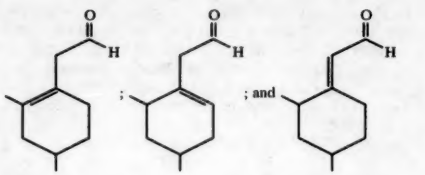
METHYL-SUBSTITUTED CYCLOHEXENYL ACETALDEHYDES, ORGANOLEPTIC USES THEREOF, PROCESSES FOR PRODUCING SAME AND INTERMEDIATES USEFUL THEREIN

Wilhelmus J. Wiegers, Red Bank, and Manfred H. Vock, Locust, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

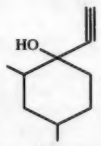
Filed Mar. 15, 1985, Ser. No. 712,170
Int. Cl.[4] C11B *9/00*
U.S. Cl. 252—522 R **3 Claims**



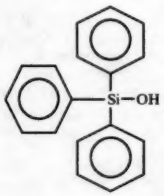
1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of perfume compositions, colognes, perfumed articles, perfumed polymers, foodstuffs, chewing gums, medicinal products and toothpastes comprising the step of adding to said consumable material a product consisting essentially of a mixture of compounds having the structures:



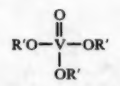
prepared according to the process of reacting the compound having the structure:



in the presence of a catalyst consisting essentially of triphenyl silanol having the structure:



and a vanadium trialkoxy oxide having the structure:



wherein R' represents n-propyl or isopropyl.

4,604,233

THICKENED AQUEOUS HYDROCHLORIC ACID COMPOSITION FOR DESCALING, OR TREATMENT OF SUBTERRANEAN FORMATIONS

Walter J. M. Rootsaert, and Carolus H. van der Loo, both of Badhuisweg, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 564,444, Dec. 22, 1983, abandoned.
This application Feb. 11, 1985, Ser. No. 700,073
Claims priority, application United Kingdom, Dec. 22, 1982, 8236481
Int. Cl.[4] C02F *5/10*; C23F *11/00*; C23G *1/02*
U.S. Cl. 252—558 **9 Claims**

1. A thickened aqueous hydrochloric acid composition comprising

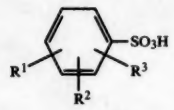
(a) 5 to 15%w hydrogen chloride,

(b) an alcohol ethoxylate of the formula

$$R—O-(CH_2—CH_2—O)_nH$$

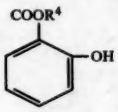
wherein R is a C_{8-18} alkyl group and n has an average value in the range 3 to 15, provided that the $(CH_2—CH_2—O)_n$ moiety constitutes 50 to 67%w of the alcohol ethoxylate,

(c) an alkyl aryl sulfonic acid of the formula



wherein R^1 is a C_{8-13} linear alkyl chain and R^2 and R^3 are independently hydrogen atoms or methyl groups, the combined concentration of (b) and (c) being in the range 5 to 12%w, the relative weight proportions of (b) and (c) being in the range 45 to 65% of (b) to 55 to 35% of (c), and

(d) 0.25 to 1%w of a salicylate of the formula



where R^4 is a C_{1-4} alkyl or a benzyl group.

4,604,234

PROTEIN HAVING CELL GROWTH STIMULATING ACTION, COMPOSITION THEREOF AND METHOD FOR PRODUCING THE SAME

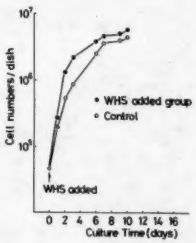
Setsuro Fujii, Toyonaka; Nobumoto Chikazawa, Nara; Teruo Arima, Amagasaki, and Masakazu Fukushima, Hirakata, all of Japan, assignors to Sanwa Kagaku Kenyusho Co., Ltd., Nagoya, Japan

Filed Feb. 28, 1984, Ser. No. 584,335

Claims priority, application Japan, Jun. 30, 1983, 58-119863

Int. Cl.[4] C07K *15/04;* C12P *21/00;* A61K *37/00*

U.S. Cl. 514—2 **30 Claims**



1. A protein having cell growth stimulating activity, said protein selected from those obtained from a culture of a microorganism selected from the group consisting of *Staphylococcus epidermidis, Bacillus subtilis, Streptococcus faecalis, Serratia marcescens, Escherichia coli, Salmonella enteritidis,* and *Proteus vulgaris,* the protein being characterized as follows:

(a) Molecular weight in the range of 5,000–12,000, when said molecular weight is calculated on the basis of a calibration curve plotting the relationship between the molecular weight and an amount eluted by high performance liquid chromatography using as marker proteins, thioglobin (M.W. 670,000), bovine γ-globulin (M.W. 158,000), fowl ovalbumin (M.W. 44,000), equine myoglobulin (M.W. 17,000), and vitamin B-12 (M.W. 1,350);

(b) Ultraviolet absorption at 278 nm;

(c) Infrared absorption spectrum with dominant peaks at 1300, 1550, and 1630 cm^{-1};

(d) Isoelectric point in the range of 4.0–6.6;

(e) Soluble in water and insoluble in methanol, ethanol, acetone and ether;

(f) Appears as a grayish white powder in the lyophilized state;

(g) Positive for the following color reactions; Xanthoprotein, Pauli, Sakaguchi, Hunter, Sullivan, Hopkins-Cove, nitrosonaphthol, Millon, Neubauer-Road, and Libermann; and

(h)

Amino Acid	mol/M
Aspartic Acid	4.25–14.33
Glutamic Acid	4.76–21.35
Glycine	3.68–10.04
Valine	3.05–8.97
Alanine	3.51–18.09
Threonine	2.20–5.69
Serine	2.01–5.14
Cystine	0.00–0.40
Methionine	0.79–2.73
Isoleucine	2.34–7.97
Leucine	2.70–8.70
Tyrosine	0.39–3.17
Phenylalanine	0.79–3.20
Lysine	2.22–8.80
Histidine	0.54–1.35
Arginine	0.65–4.83
Proline	2.63–5.37
Tryptophan	0.25–0.70

said protein exhibiting cell growth stimulating activity in a pH range between 4–10; and being substantially free of nucleoside phosphotransferase.

4,604,235

PURIFICATION OF MONOCLONAL ANTIBODIES

Michael Flashner, Easton, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed May 23, 1984, Ser. No. 613,248

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.[4] A61K *39/395;* C07K *3/20, 15/06*

U.S. Cl. 530—387 **5 Claims**

1. A method of obtaining essentially homongeneous monoclonal antibody type IgM from a sample of mouse ascites fluid containing said monoclonal antibody which comprises separating and recovering said monoclonal antibody from said sample by employing liquid chromatographic means wherein the chromatographic packing consists essentially of particulate silica gel having an average particle diameter of from about 3 to about 40 microns and an average pore size of from about 50 to about 1000 Angstrom units to which polyethylenimine functions are bound in covalently bound non-crosslinked form or in adsorbed crosslinked form.

4,604,236

CALCITONIN ANALOGS

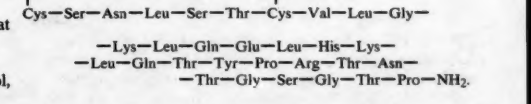
Ronald C. Orlowski, 140 Pueblo Ct., Frankfort, Ill. 60423, and Jay K. Seyler, 581 W. Drummond Dr., Bourbonnais, Ill. 60919

Filed Mar. 18, 1985, Ser. No. 713,156

Int. Cl.[4] C07K *7/36*

U.S. Cl. 530—307 **6 Claims**

1. The peptide having the structure:



4,604,237
DES-21-THREONINE-CALCITONIN

Ronald C. Orlowski, Frankfort; Jay K. Seyler, Bourbonnais, and Glenn L. Stahl, Bradley, all of Ill., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Filed Nov. 20, 1984, Ser. No. 673,300
Int. Cl.[4] C07K *7/36*
U.S. Cl. 530—307 **7 Claims**

1. A peptide having the structure:

Cys—Ser—Asn—Leu—Ser—Thr—Cys—Val—Leu—Gly—
—Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
—Tyr—Pro—Arg—Thr—Asn—Thr—Gly—Ser—Gly—Thr—
—Pro—NH_2: Salmon,

Cys—Ser—Asn—Leu—Ser—Thr—Cys—Val—Leu—Gly—
—Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—Thr—
—Pro—NH_2: Eel, or

Cys—Gly—Asn—Leu—Ser—Thr—Cys—Met—Leu—Gly—
—Thr—Tyr—Thr—Gln—Asp—Phe—Asn—Lys—Phe—His—
—Phe—Pro—Gln—Thr—Ala—Ile—Gly—Val—Gly—Ala—
—Pro—NH_2: Human.

4,604,238
ANALOGS OF CALCITONIN

Ronald C. Orlowski, Frankfort; Jay K. Seyler, Bourbonnais, and Glenn L. Stahl, Bradley, all of Ill., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Filed Dec. 10, 1984, Ser. No. 680,195
Int. Cl.[4] C07K *7/36*
U.S. Cl. 530—307 **5 Claims**

1. The peptide having the structure:

Cys—Gly—Ser—Leu—Ser—Thr—Cys—Gly—Leu—Gly—
—Lys—Leu—Ser—Gln—Glu—Leu—His—
—Lys—Leu—Gln—Thr—Pro—Arg—Thr—Asn—
—Thr—Gly—Ser—Gly—Thr—Pro—NH_2.

4,604,239
ANTIBIOTICS

Karl H. Michel, and Ralph E. Kastner, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 662,464, Oct. 18, 1984, Pat. No. 4,537,770, which is a continuation of Ser. No. 443,496, Nov. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 361,301, Mar. 24, 1982, abandoned. This application Jun. 11, 1985, Ser. No. 743,233
Int. Cl.[4] C07K *7/50*
U.S. Cl. 530—317 **1 Claim**

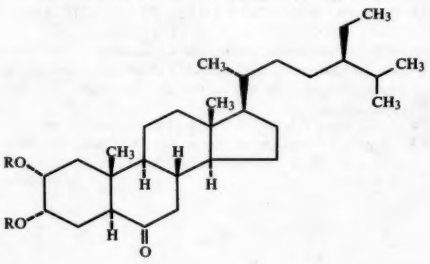
1. The A41030 complex of antibiotics which is produced by cultivating *Streptomyces virginiae* NRRL 12525, *Streptomyces virginiae* NRRL 15156 or an A41030-producing mutant or variant of *S. virginiae* NRRL 12525 or NRRL 15156 under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced.

4,604,240
HOMOBRASSINOLIDE, AND ITS PRODUCTION AND USE

Kenji Mori, Tokyo; Tetsuo Takematsu, Tochigi; Masayuki Sakakibara, Chiba, and Hiromichi Oshio, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 443,018, Nov. 19, 1982, abandoned. This application Dec. 11, 1984, Ser. No. 680,471
Claims priority, application Japan, Nov. 24, 1981, 56-188818
Int. Cl.[4] C07J *71/00*
U.S. Cl. 540—114 **3 Claims**

2. A compound of the formula:



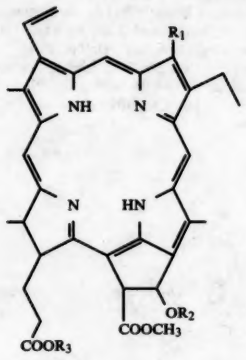
wherein R is a hydrogen atom or an acyl group.

4,604,241
9-DESOXO-9-HYDROXY-PHEOPHORBIDE DERIVATIVES AND ALKALINE SALTS THEREOF

Isao Sakata, 1766-4, Obira, Kasaoka City, Okayama Pref.; Susumu Nakajima, 4-4-34, Gojo, Midorigaoka, Asahikawa City, Hokkaido; Koichi Koshimizu, 385-10 Horensan soinishi cho, Nara City, Nara Pref.; Natsuki Samejima, A-42, Idai Shukusha, 3-3 Nijo, Midorigaoka, Asahikawa Ci; Kazumi Inohara, 3-9-7 Mikado cho, Fukuyama City , Hiroshima Pref., and Hiroyuki Takata, 2098 Satomi, Satosho cho, Asakuchi gun, Okayam Pref., all of Japan

Filed Oct. 24, 1984, Ser. No. 664,375
Claims priority, application Japan, Oct. 24, 1983, 58-198934
Int. Cl.[4] C07D *487/22*
U.S. Cl. 540—145 **1 Claim**

1. 9-desoxo-9-hydroxy-pheophorbide derivatives and alkaline salts thereof represented by the general formula:



wherein

R_1 represents CH_3 or CH_2OH,

R_2 represents H or acetyl, and

R_3 represents H or an alkali metal atom.

4,604,242

PREPARATION OF DIALIPHATIC, DIALICYCLIC, OR DI(ARYL-SUBSTITUTED ALIPHATIC) CARBONATES

A. Dale Harley; Jerald L. Curnutt, and David T. Doughty, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 19, 1984, Ser. No. 590,596

Int. Cl.[4] C07C *68/00*

U.S. Cl. 558—260 8 Claims

1. A process for the preparation of a symmetrical or unsymmetrical dihydrocarbyl carbonate which comprises contacting an aliphatic, cycloaliphatic or di(aryl-substituted aliphatic)alcohol or mixtures thereof with carbon monoxide and oxygen in the presence of between about 0.1 and 10 percent by weight based on the alcohol of bis((2,4-pentanedianato)copper (II) methoxide) and a cocatalytic amount of a basic nitrogen-containing coordination compound selected from the group consisting of a trialkylamine, pyridine, a substituted pyridine, imidazole, ammonia or acetonitrile, under conditions such that a symmetrical or unsymmetrical dihydrocarbyl carbonate is prepared.

4,604,243

ARYLATION OF OLEFINS

Robert I. Davidson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 25, 1985, Ser. No. 758,818

Int. Cl.[4] C07C *121/66, 69/612*

U.S. Cl. 558—388 18 Claims

1. In a process for adding halogen and an aryl group to the double bond of an olefin by reacting an arylamine with the olefin in the presence of an alkyl nitrite, a copper catalyst, and an inert polar organic solvent, the improvement which comprises conducting the reaction in the presence of at least one equivalent of a hydrogen halide and employing as the catalyst a catalytic amount of a copper catalyst having the copper in an oxidation state below +2.

4,604,244

PROCESS FOR MAKING ADIPONITRILE PRECURSORS

James D. Burrington, Richmond Hts.; Robert K. Grasselli, Aurora, both of Ohio, and Craig T. Kartisek, Eugene, Oreg., assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 455,081, Jan. 3, 1983, abandoned. This application Apr. 23, 1984, Ser. No. 603,257

Int. Cl.[4] C07C *120/00, 120/14, 121/30*

U.S. Cl. 558—320 8 Claims

1. A process which comprises contacting a reactant of the formula:

$$H-(CH_2)_a-(CH=CH)-(CH_2)_bX$$

with oxygen and ammonia to thereby form a product of the formula:

$$NC-CH=CH-CH=CH-X$$

wherein

X is —CN or —$CONH_2$ and each of a and b are zero or an integer from 1 to 3 such that a+b=3, and

wherein said contacting of said reactants is effected while said reactants (1) are in the gaseous phase and are in contact with a solid oxidation catalyst which is effective to catalyze the ammoxidation of propylene to acrylonitrile, and (2) are in the temperature range from 250° to 650° C.

7. A process which comprises:

(a) reacting propylene with an enophile of the formula:

$$CH_2=CH-X$$

wherein

X is —CN or —$CONH_2$ to form a cyano or amidoalkene intermediate of the formula:

$$CH_2=CH-(CH_2)_3-X, \text{ and}$$

(b) contacting and reacting said intermediate with molecular oxygen and ammonia to thereby form a product of the formula:

$$NC(CH=CH)_2-X$$

wherein

X is —CN or —$CONH_2$, and wherein said contact is effected while the reactants (1) are in the gaseous phase and are in contact with a solid oxidation catalyst which is effective to catalyze the ammoxidation of propylene to acrylonitrile, and (2) are in the temperature range from 250° to 650° C.

4,604,245

PERFUME DISPENSING DEVICE

D. Arturo M. Gutierrez, Paseo Pinter Rosales, 38, 28008-Madrid, Spain

Filed May 3, 1985, Ser. No. 730,323

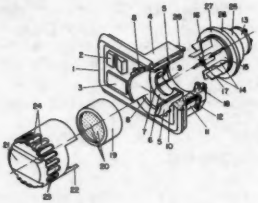
Claims priority, application Spain, May 18, 1984, 279.366

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—26 8 Claims

1. Panellable perfume dispenser for cars of timed and/or manual operation, insertable in a housing provided for such purpose in the front panel or dashboard of a car, characterized because it comprises a structure formed by a plate or front panel, with its perimetric border rounded and increased frontally in weight, on the surface of which have been cut, on one part, sundry orifices in which are housed respectively a switch and a pulsator, and on the opposite part, an orifice of greater diameter from the edge of which starts towards the interior an extension which forms a cylindrical housing provided with an internal wall, parallel to that of the cylindrical extension and separated therefrom, divided into two zones by an intermediate transversal wall provided with a broad central orifice, so that in the zone of the internal wall in the rear of the aforesaid

transversal wall have been cut two broad rectangular notches in diametrically opposite positions, whereas the zone of the



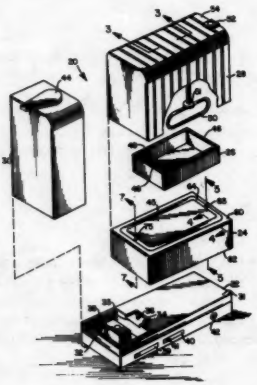
internal wall in front of said transversal wall likewise has two broad rectangular notches in diametrically opposite positions.

4,604,246

COMBINATION HUMIDIFIER/WATER DISTILLER

Pil Y. Choe, Dunellen, N.J., assignor to Prodel Corp., Dunellen, N.J.

Filed Dec. 21, 1984, Ser. No. 685,033
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—71 **16 Claims**



1. A combination humidifier/water distiller apparatus comprising:

a container for holding tap water;

a heater for heating tap water in the container to a vaporized state;

a condenser for the condensation of vaporized tap water into distilled water;

a receptacle for the collection of said distilled water and including means for removing said distilled water therefrom;

nebulizer means for converting liquid into a fine spray;

said container, heater, condenser, receptacle and nebulizer means assembled together in an integrated, utilized, compact module; and

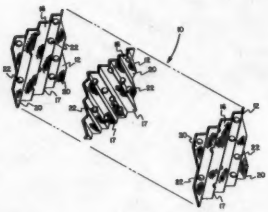
passage means associated with said nebulizer means and said receptacle for the supply of distilled water from said receptacle to said nebulizer means so that distilled water is nebulized to the fine spray, said nebulizer means including means for delivering said fine spray to the atmosphere to thereby humidify the surrounding air.

4,604,247

TOWER PACKING MATERIAL AND METHOD

Gilbert Chen, Farmers Branch; B. Layton Kitterman; Donald L. Glaspie, both of Dallas, and John R. Axe, Arlington, all of Tex., assignors to Glitsch, Inc., Dallas, Tex.

Continuation of Ser. No. 506,534, Jun. 21, 1983, abandoned.
This application Apr. 19, 1985, Ser. No. 725,143
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—94 **18 Claims**



9. An improved method of improving vapor liquid contact within a process tower of the type comprising the steps of providing a generally vertical tower having means for ingressing the flow of vapor at the lower region thereof and means for ingressing a stream of liquid at the upper region thereof and a series of layers of grid sections comprising generally vertically oriented corrugated sheets of unexpanded material with the corrugations of adjacent sheets being inclined one to the other between said liquid and vapor ingressing means for receiving the descending flow of liquid and the ascending flow of vapor concomitantly therethrough, said improvement comprising the steps of providing said corrugated sheets with a plurality of parallel, elongate, spaced apart slits formed through solid surfaces of each sheet with the total area of all of said slits being smaller than the total area of said solid surfaces, providing said slitted sheets with a plurality of relatively larger apertures spaced apart by said solid surfaces for effecting the flow of vapor and liquid therealong and within the corrugations of said adjacent sheets for enhancing the vapor liquid interaction, and the further step of orienting the longitudinal axes of said elongate slits in said sheets to extend generally transversely to said vapor liquid flow and said corrugations for imparting turbulence thereto along with a transverse spreading effect to the liquid flowing down and through said sheets.

15. A tower packing comprising a plurality of sheets of unexpanded material, a plurality of corrugations formed on each sheet, said sheets being disposed in face-to-face contact with the corrugations of each sheet extending at an angle to the corrugations of its adjacent sheets to define flow paths for a descending liquid and an ascending vapor, a plurality of relatively large orifices formed through and spaced apart by solid surfaces of each sheet for permitting passage of said liquid and vapor therethrough to distribute the liquid over said sheets and equalize the pressure of said vapor, and a plurality of relatively small elongated slits formed through the solid surfaces of each of said sheets, the slits in each sheet being spaced longitudinally from each other in parallel rows with the longitudinal axes of said slits extending transversely across said corrugations, the total area of all of said slits being smaller than the total area of said solid surfaces, a portion of each sheet adjacent each slit being displaced from the plane of said sheet, to enhance vapor-liquid contact along said sheets.

4,604,248

CHEMICAL CASE BOND SYSTEM WITH AZIDO COMPOUND BONDING

Henry C. Dehm, Salt Lake City, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 31, 1985, Ser. No. 697,094
Int. Cl.[4] C06B 21/00
U.S. Cl. 264—3.1 32 Claims

1. A method of bonding a solid propellant to the inner surface of an elastomeric insulator carried by a rocket motor chamber, said solid propellant being solidified by crosslinking propellant ingredients of said solid propellant with a polyfunctional propellant crosslinker dispersed throughout said ingredients, said method comprising

(a) applying a thin film to said inner surface, said film comprising an azido composition selected from the group consisting of (i) a polyfunctional azido compound or polymer that additionally has crosslinker reactive functionality that is reactive with said polyfunctional propellant crosslinker, (ii) a polyazido compound or polymer and a polyfunctional graftable compound or polymer having (a) functionality that is reactive with azido functionality of said polyazido compound or polymer as well as (b) crosslinker reactive functionality that is reactive with said polyfunctional propellant crosslinker and (iii) a combination of (i) and (ii);

(b) exposing said film to sufficient energy in the form of heat or light or a combination thereof to cause azido functionality of said azido compositions to react with said insulator and graft said crosslinker reactive functionality to the surface of said elastomeric insulator;

(c) placing uncured propellant that contains said propellant crosslinker and solidifies into said solid propellant upon curing thereof in contact with said grafted surface applied in (b);

(d) curing said propellant such that said propellant crosslinker reacts with said functionability that is reactive therewith and bonded to said insulator surface thereby bonding said insulator to said solid propellant binder polymer.

4,604,249

METHOD OF PRODUCING COMPOSITE ARMOR PLATE BODIES

Hartmut Luhleich, Düren, and Francisco J. Dias, Jülich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 233,474, Feb. 11, 1981, abandoned.
This application Nov. 16, 1984, Ser. No. 672,170
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005586
Int. Cl.[4] C04B 35/34
U.S. Cl. 264—29.5 3 Claims

1. A method of making armor plate comprising the steps of:

making a porous body of silicon carbide in the shape of an armor plate element, having open and through-penetrating pores therein, by preparing a deformable mass of particles of silicon and carbon, all coated with an organic binder by suspending and mixing particles of silicon and particles of carbon in a binder solution from which the binder is thereafter precipitated by introducing the suspension into a liquid serving to precipitate the binder on the particles as an even coating, molding said mass into armor plate shape by extrusion or in a low pressure diepress, coking the binder of the molded body at a temperature in the range from 800° C. to 1000° C., raising the temperature to a temperature in the range from 1400° C. to 1600° C. to form silicon carbide and cooling the body thus produced;

evacuating the pores of said body in a pressure vessel, then soaking said body in a melt of a metallic material selected from the group consisting of steel and steel alloys under pressure of at least 1 bar to fill said pores with said metallic material, and then

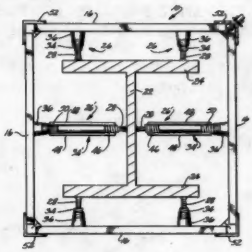
cooling said body and thereby solidifying the metallic material.

4,604,250

COLUMN FORM SUPPORT SYSTEM AND METHOD

Fred L. Ecker, Sierra Madre, Calif., assignor to Concrete Systems, Inc., Azusa, Calif.

Filed Oct. 24, 1984, Ser. No. 664,481
Int. Cl.[4] B28B 23/18
U.S. Cl. 264—35 2 Claims



1. A form about an upstanding column for receiving concrete including:

interconnected form panels disposed about said column to define a form to receive concrete; and

means for supporting and adjustably spacing the panels about the column without attachment thereto, the supporting means including,

at least one stud affixed to and projecting from the column to support a corresponding form panel, and

a bearing member removably coupled to and adjustably positionable at the end of each stud, each bearing member having a base spaced from the column, the bearing member bases at each side of the column arranged to be coplanar,

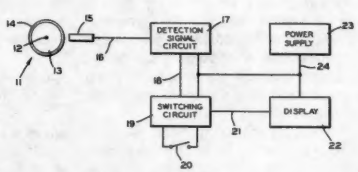
said form panels bearing against the bearing member bases to support the panels in the planes defined by said bases.

4,604,251

METHOD AND APPARATUS FOR INDICATING DIMENSIONAL RELATIONSHIPS IN PLASTIC MATERIAL FEEDING DEVICE DURING OPERATION

Jeffrey A. Kuhman, 8905 Hawthorne Blvd., Tecumseh, Mich. 49286

Filed Jun. 14, 1985, Ser. No. 745,297
Int. Cl.[4] G01R 33/12
U.S. Cl. 264—40.2 12 Claims



1. An apparatus for indicating the dimensional relationship between an external surface of a flight on a screw and a predetermined reference point on an inner surface of a barrel in a plastic material feeder comprising:

an eddy current sensing probe positioned in an aperture formed in a side wall of a barrel of a plastic material feeder, said probe being located adjacent a predetermined reference point on an inner surface of the barrel and adja-

cent the path of travel of an outer edge of a flight on a screw in the barrel;

a detection signal circuit connected to said probe for exciting said probe and for generating an output signal with a magnitude proportional to the distance between said probe and the outer edge of the flight; and

means responsive to said output signal for generating an indication of the distance between the outer edge of the flight and said predetermined reference point.

4,604,252

PROCESS FOR THE PRODUCTION OF A PROFILE FROM DRY POWDER MATERIAL ALONG WITH A CONTRIVANCE FOR THIS PURPOSE

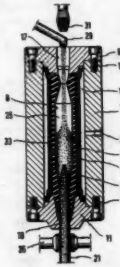
Anton Stigler, Am Rad 5½, 8240 Berchtesgaden, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 610,195

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1983, 3321285

Int. Cl.[4] B28B *3/00*

U.S. Cl. 264—120 **4 Claims**



1. In a process for the production of a profile structure from dry powder material selected from the group consisting of ceramic powder and powdered metals by means of a radially flexible elastic mold form surrounding, in sleeve fashion, a mold cavity with the radially flexible form being capable of being placed under external pressure radially inwardly over its entire length, and thereby radially compact the powder material disposed in the mold cavity between the inner surfaces of the flexible form; the process being characterized in that the production of a profile structure of unlimited length is accomplished by preparation of segments and, additionally, that the dry powder material is introduced into a mold form of constant diameter at the outlet end with the diameter being up to the profile diameter and with the first end being restricted by the presence of the previously compacted profile segment and with the opposed end of the flexible form having inner surfaces mutually converging toward a top feed supply opening and wherein the process includes the steps of:

(a) filling the said mold cavity with a uniform and measured amount of the dry powder material;

(b) closing the top supply opening with the converging surfaces providing a tapered trailing zone for said powder fill material;

(c) compacting the dry powder material therein while the trailing end of the previously compacted profile structural section is held firmly clamped adjacent the outlet end of the said mold form, the arrangement being such that because of the convergence of the elastic form toward the feed supply opening, the tapered end of the previously compacted profile is covered over by the radially compacted dry powder material and, thereby, is joined therewith; and

(d) the profile segment being unloaded from the flexible form and with the newly compacted profile section being advanced to the extent that that certain region of the flexible form surrounding the converging portion of the mold cavity surrounds the tapered end of the previously compacted profile section.

4,604,253

PROCESS FOR FORMING PLASTICIZED POLYVINYL BUTYRAL INTERLAYERS

I. Luis Gomez, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 523,305, Aug. 15, 1983, Pat. No. 4,574,136.

This application Feb. 27, 1985, Ser. No. 706,052

Int. Cl.[4] B29B *11/10, 11/02*

U.S. Cl. 264—211 **5 Claims**

1. In a process for the preparation of polyvinyl butyral sheet by blending polyvinylbutyral with a plasticizer which is a multiester of an alcohol having 2 to 4 hydroxyl groups and a C_{16} to C_{20} unsaturated fatty acid having a hydroxyl group attached to the acid molecule and extruding the blend to form a sheet, the improvement which comprises adding to the blend a monoester of a glycol and said C_{16} to C_{20} unsaturated fatty acid, the ratio of said monoester to said multiester being between about 1:1 to about 5:1.

4,604,254

BUTTERFLY VALVE

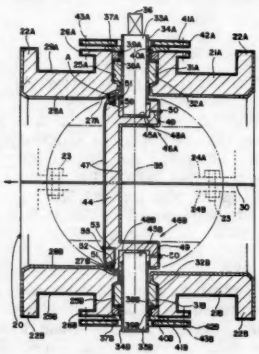
Masahiko Yamamoto, Nishinomiya; Yoshinori Nishino, Yamato-takada; Tadayoshi Uda, Izumi; Yoshiteru Sonoda, Habikino, and Toshio Suyama, Osaka, all of Japan, assignors to Hitachi Zosen Corporation and Jujikin International, Inc., Osaka, Japan

Filed May 20, 1985, Ser. No. 735,858

Claims priority, application Japan, May 23, 1984, 59-105156; May 23, 1984, 59-76228[U]; May 23, 1984, 59-76229[U]; May 23, 1984, 59-76230[U]; May 23, 1984, 59-76231[U]; May 23, 1984, 59-76232[U]; May 23, 1984, 59-76233[U]

Int. Cl.[4] F16K *1/22;* B28B *7/22*

U.S. Cl. 264—254 **14 Claims**



1. A method of fabricating a butterfly valve comprising a substantially cylindrical casing (**20**) having an inner circumferential surface formed with an annular valve seat (**A**), a pair of stem bores (**25A, 25B**) formed through said casing (**20**) at diametrically opposite locations thereof, valve stem means (**33A, 33B**) rotatably extending through said pair of stem bores (**25A, 25B**), a valve disk (**44**), stem mount means (**46A, 46B**) on said valve disk (**44**) attaching said valve disk (**44**) to the valve stem means (**33A, 33B**), the valve disk (**44**) having an outer peripheral edge portion opposed in its entirety to the valve seat (**A**) when the valve disk (**44**) is in its closed position, an annular groove (**52**) in the outer peripheral portion of said valve disk (**44**), and an annular valve seal (**51**) partially fitted in said annual groove (**52**), a resin injection channel (**53**) with which

the annular groove (52) is in communication, said valve seal (51) being radially deformed and anchored in the annular groove (52) by first resin (58) injected into the groove (52) through the resin injection channel (53) at a predetermined pressure so that the valve seal (51) is pressed uniformly against the valve seat (A) when the valve disk (44) is in its closed position, wherein the method is characterized in that,

(a) prior to introducing the valve disk (44) into the casing (20) and inserting the valve stem means (33A, 33B) through the stem bores (25A, 25B) of the casing (20), a dummy stem (64) having a diameter equal to the diameter of the valve stem means (33A, 33B) is inserted through the stem bores (25A, 25B),

(b) a bearing ring (31A, 31B) is fitted on the dummy stem (64) and placed in each stem bore (25A, 25B),

(c) the dummy stem (64) is adjusted to a predetermined position relative to the casing (20) with a clearance formed between the bearing ring (31A, 31B) and the stem bore (25A, 25B),

(d) the clearance is filled with second resin (32A, 32B) injected under pressure so that the bearing ring (31A, 31B) is anchored in place upon curing of the second resin (32A, 32B),

(e) the dummy stem (64) is removed from the anchored bearing ring (31A, 31B),

(f) the valve disk (44) is introduced into the casing (20),

(g) the valve stem means (33A, 33B) is inserted through the anchored bearing ring (31A, 31B) so as to be received by the stem mount means (46A, 46B) of the valve disk (44),

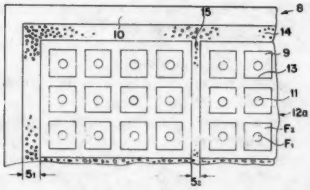
(h) the valve disk (44) is adjusted to a predetermined position relative to the valve seat (A) with a second clearance formed between the valve stem means (31A, 31B) and the stem mount means, and

(i) the second clearance is filled with third resin (48A, 48B) injected under pressure so that the valve stem means (31A, 31B) is anchored onto the stem mount means (46A, 46B) upon curing of the third resin (48A, 48B).

4,604,255
METHOD FOR FABRICATING MOLDED BODIES FORMED AT LEAST PARTIALLY OF SWELLED CLAY MATERIAL AND APPARATUS FOR THE PERFORMANCE OF THE METHOD

Hans Walt, Schlatt, and Dieter Sütterlin, Frick, both of Switzerland, assignors to Keller Holding AG, Pfungen, Switzerland

Continuation of Ser. No. 193,405, Jan. 14, 1980, abandoned. This application Jun. 16, 1983, Ser. No. 504,899
Int. Cl.⁴ B28B *3/00*
U.S. Cl. 264—273 **38 Claims**



1. A method of manufacturing substantially cubic molded bodies comprising the steps of:

arranging, in a mold box having a predetermined surface area in top plan view and containing sidewalls and a mold floor, on said mold floor and and between predetermined mold sidewalls made of a granular filler material at least one blank made of a blank material containing a heat-swellable clay component and having a predetermined surface area in top plan view which is smaller than said predetermined surface area in top plan view of said mold box, said at least one blank possessing an underside and a topside and a predetermined number of hollow spaces extending therebetween;

filling a preselected number of said predetermined number of said hollow spaces with said granular filler material;

heating said mold box containing said at least one blank at a predetermined swelling temperature in order to swell said heat-swellable clay component contained in said blank material;

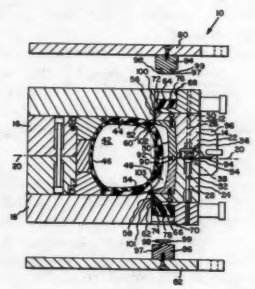
cooling said mold box containing said at least one heat-swelled blank in order to obtain a swelled and solidified blank; and

removing said at least one swelled and solidified blank and said granular filler material which originally formed said predetermined mold sidewalls and which granular filler material is in a friable state at least during this step of removing the at least one swelled and solidified blank, in order to obtain at least one of said substantially cubic molded bodies.

4,604,256
PROCESS AND APPARATUS FOR INJECTION MOLDING TIRE TREADS

Alan Greenwood, Kent, and Norbert Majerus, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 31, 1985, Ser. No. 760,937
Int. Cl.⁴ B29D *30/06;* **B29C** *45/02, 45/14*
U.S. Cl. 264—501 **23 Claims**



1. Apparatus for injection molding of the tread portion of a tire comprising a mold having a tread molding ring member, said mold containing an annular tread molding space, said tread molding space having a molding surface on said tread molding ring member, annular side members at each side of said tread molding ring member, each of said side members having a runner surface, said tread molding ring member having at least one runner surface movable into closely spaced relationship with said runner surface of each of said side members to form generally annular gates and annular runner passages between said tread molding ring member and said side members in a closed position of said mold, said side members having side member passages in communication with a source of fluid molding compound and with said annular runner passages, and said generally annular gates being positioned at the edges of said tread molding ring member for introducing said fluid molding compound into said tread molding space at the edges of said tread molding ring member.

18. A process for injection molding the tread portion of a tire comprising:

(a) locating a tire casing in a tire mold having a tread molding ring member providing a tread molding space between said casing and a molding surface of said tread molding ring member in the closed condition of said mold;

(b) closing said mold with said tire casing therein;

(c) inflating said tire casing;

(d) introducing fluid molding compound into said tread molding space substantially uniformly around the circumference of said molding space while maintaining a temperature and pressure above the curing temperature and pressure of said fluid molding compound until said tread molding space is filled, said fluid molding compound being introduced from the side edges of said tread molding space through annular gate means positioned at each side edge of said tread molding space whereby said fluid molding compound flows toward the midplane of the tire casing without any appreciable flow in a circumferential direction and with said incoming flow providing two leading surface portions meeting at said midplane;

(e) at least partially curing said fluid molding compound in said tread molding space to mold said tread portion on said tire casing; and

(f) opening said mold for removing said tire casing with the molded tread.

4,604,257

MULTI-LAYER POLYISOPHTHALATE AND POLYTEREPHTHALATE ARTICLES AND PROCESS THEREFOR

Richard R. Smith, Cuyahoga Falls, and Charles L. Kern, Jr., North Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 415,306, Sep. 7, 1982, Pat. No. 4,482,586. This application Sep. 17, 1984, Ser. No. 651,420

Int. Cl.[4] B29C *45/16, 49/06*

U.S. Cl. 264—513 **15 Claims**

1. A process for making a multi-layer packaging material, comprising the steps of:

(a) forming at least one layer made from a polyterephthalate compound, said polyterephthalate compound made by the reaction of terephthalic acid or esters thereof with ethylene glycol and up to 30 mole percent of one or more glycols selected from the group consisting of tetramethylene glycol and propylene glycol:

(b) forming at least one layer made from a polyisophthalate compound, said polyisophthalate compound consisting of the reaction product of isophthalic acid or esters thereof with ethylene glycol and from 0 to 60 mole percent of one or more glycols selected from the group consisting of tetramethylene glycol and propylene glycol; wherein said polyisophthalate compound has an oxygen permeability of 8cc·mil/100 in^2·day·atm or less; and

(c) contacting said polyisophthalate layer with said polyterephthalate layer and forming the packing material.

10. A process for making a multi-layer packaging material, according to claim **1**, including forming a container, forming said container by injection molding said polyterephthalate layer at a temperature of from about 500° to about 550° F., injection molding said polyisophthalate layer at a temperature of from about 400° F. to about 500° F., and injection molding said polyisophthalate layer over said polyterephthalate layer.

11. A process for making a multi-layer packaging material according to claim **10**, including orienting said injection molded article by blow-molding said article to form said container.

4,604,258

STACK-MOLD FOR INJECTION BLOW MOLDING

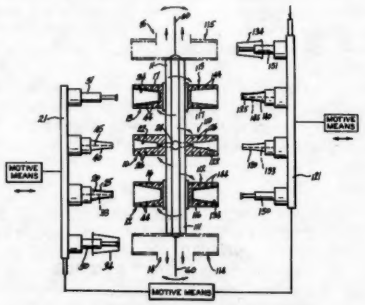
Emery I. Valyi, Stamford, Conn., assignor to Canada Cup, Inc., Toronto, Canada

Filed Nov. 15, 1984, Ser. No. 671,596

Int. Cl.[4] B29C *49/06, 49/32*

U.S. Cl. 264—537 **6 Claims**

1. Process for injection blow molding hollow plastic articles which comprises providing back-to-back first and second injection molds each including a respective first and second mold cavity formed by a respective first and second mold wall, each of said cavities cooperating with a respective first and second core, back-to-back first and second blow molds each adjacent respective first and second mold cavities in side-by-side relationship therewith, back-to-back first and second ejection stations in side-by-side relationship with said respective first and second blow molds, and first and second ejection mandrels adjacent respective first and second cores, and engageable with said first and second ejection stations, respectively, wherein said cores, mandrels, blow molds and ejection stations comprise a first set and a second set, respectively, and including the step of providing a third and fourth set of cores, mandrels, blow molds and ejection stations adjacent and in line with the first and second set, respectively, with said blow molds and ejection stations being in back-to-back relationship with each other and on opposite sides of said first and second injection molds, injecting molten plastic into said mold cavities to form first and second parisons on said cores, moving said parisons on said cores into said blow molds, expanding said parisons on said cores in said blow molds to form hollow articles, transferring said hollow articles to said ejection stations from said blow molds on said ejection mandrels and removing said hollow articles from said ejection stations, wherein said first and second cores and said first and second mandrels operate in overlapping cycles whereby said first core and first mandrel are located at said first injection mold and first blow mold, respectively, while said second core and second mandrel are located at a position spaced from said second injection mold and second blow mold, respectively and whereby said first core and first mandrel are located at said



first blow mold and first ejection station, respectively, while said second core and second mandrel are located at a position spaced from said second blow mold and second ejection station, respectively, and said third and fourth sets are simultaneously in corresponding positions, including the step of providing a common platen for said first and third cores and a common platen for said second and fourth cores, with a balanced motive means for both platens and moving said common platens via said balanced motive means.

4. An apparatus for injection blow molding hollow plastic articles which comprises back-to-back first and second injection molds each including a mold wall, opposing first and second cores each engageable with a respective injection mold to form a mold cavity with its respective mold wall, means to inject molten plastic into said mold cavities to form parisons therein, back-to-back first and second blow molds adjacent respective injection mold cavities in side-by-side relationship therewith, back-to-back first and second ejection stations adjacent respective blow molds in side-by-side relationship therewith, first and second ejection mandrels in side-by-side relationship with said first and second cores engageable with said first and second ejection stations, respectively, wherein said cores, mandrels, blow molds and ejection stations comprise a first and second set, respectively, and a third and fourth set of cores, mandrels, blow molds and ejection stations adjacent and in line with the first and second set, respectively, with said blow molds and ejection stations being in back-to-back relationship with each other and on opposite sides of said first and

second injection molds, means to move said parisons from said first and second injection molds to said first and second blow molds and means to expand said parisons in said blow molds to form hollow articles therein, means to move said hollow articles on said ejection cores from said blow molds to said ejection stations for removal therefrom, and means to locate said first and second cores in overlapping cycles wherein said first core and first mandrel are located at said first injection mold and first blow mold, respectively, while said second core and second mandrel are located at a position spaced from said second injection mold and second blow mold, respectively, and wherein said first core and first mandrel are located at said first blow mold and first ejection station, respectively, while said second core and second mandrel are located at a position spaced from said second blow mold and second ejection station, respectively, and wherein said third and fourth sets are simultaneously in corresponding positions, including a common platen for said first and third cores and a common platen for said second and fourth cores, with a balanced motive means for both platens.

4,604,259

PROCESS FOR MAKING COPPER-RICH METAL SHAPES BY POWDER METALLURGY

Charles I. Whitman, Bay Village, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 540,973, Oct. 11, 1983, abandoned. This application Sep. 19, 1985, Ser. No. 777,768

Int. Cl.[4] B22F *7/00*

U.S. Cl. 75—247 **10 Claims**

1. A process for the production of a metal shape which comprises the steps of:

(a) forming a coherent forerunner shape consisting essentially of cupreous powder containing at least about 80% by weight of copper oxide and from 1% to 20% by weight of a fugitive binder,

(b) contacting said forerunner shape with a reducing atmosphere, and

(c) elevating the temperature of said shape in said atmosphere to from about 760° C. to a temperature below the melting point of copper, whereby said binder is removed, the copper oxide is reduced to copper metal and the copper metal is sintered to form a porous sintered mass of copper substantially free of copper oxide.

4,604,260

METHOD OF PRODUCING ELECTROLYTIC CAPACITOR WITH AL-TI ANODE BODY

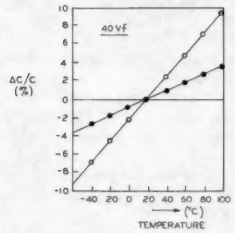
Shigeaki Shimizu, and Yoshio Arai, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,944

Claims priority, application Japan, May 22, 1984, 59-102880

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—2 **12 Claims**



1. A method of producing an Al-Ti alloy solid electrolytic capacitor comprising steps of forming a porous Al-Ti alloy body, anodizing the Al-Ti alloy body to form an oxide layer onto said Al-Ti alloy body, and heating the anodized Al-Ti alloy body in an oxygen atmosphere at a temperature in the range of approximately 500° C. to 700° C.

4,604,261

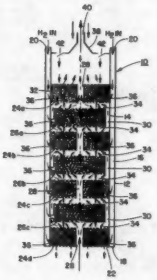
HYDROPROCESSING REACTOR FOR CATALYTICALLY DEWAXING LIQUID PETROLEUM FEEDSTOCKS

Nai Y. Chen, Titusville, N.J., and Thomas F. Degnan, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,519

Int. Cl.[4] B01J *8/04*

U.S. Cl. 422—191 **12 Claims**



1. A hydroprocessing reactor for catalytically dewaxing liquid petroleum feedstocks comprising:

(a) a substantially vertical, open-bottomed container having an inner and an outer wall defining an annular space therebetween, means for sealing the lower end of said annular space, and a central portion within said inner and outer walls;

(b) a plurality of vertically tiered trays mounted within the central portion of said container, and defining flow passageways intermediate said trays; a bed of crystalline aluminosilicate catalyst being supported on each of said trays;

(c) inlet means at the upper end of said container for the infeed of liquid petroleum feedstock into said central portion of said container to cause said liquid feedstock to trickle downwardly through said catalyst beds and trays towards the open bottom end of said container;

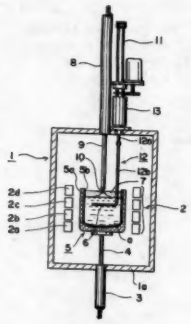
(d) inlet means at the upper end of said annular spaced for the infeed of hydrogen; apertures in said inner wall communicating said annular space with the lower portion of each of said catalyst beds to cause hydrogen to percolate upwardly through the catalyst bed on each tray and react with the liquid petroleum feedstock trickling downwardly therethrough and to strip low-boiling volatile conversion products from the liquid petroleum feedstock, said hydrogen gas and entrained conversion products flowing into the flow passageways intermediate said catalyst beds and trays; and

(e) an inlet to the flow passageways, said inlet being located at the bottom end of said container for introducing an upwardly directed flow of inert carrier gas into said flow passageways, further including flow passage means providing flow communication with said inlet and said passageways whereby said carrier gas and the hydrogen gas with the entrained conversion products are conducted upwardly through said flow passageways and scavenged from the upper end of said container.

4,604,262
APPARATUS FOR POSITIONING AND LOCATING A BAFFLE PLATE IN A CRUCIBLE

Minoru Nishizawa, Tokyo, Japan, assignor to Gakei Electric Works Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,410
Claims priority, application Japan, Aug. 31, 1984, 59-182438
Int. Cl.[4] B01D *9/00*
U.S. Cl. 422—310 **11 Claims**



1. A baffle plate positioning and locating apparatus for use in pulling a single crystal from a feed melt maintained in an inert gas atmosphere of a high pressure while maintaining a baffle plate in a predetermined position below the surface of the feed melt, comprising a plurality of cylinders each of a hermetically sealed structure adapted to be hermetically sealed to a furnace in which a crystal growing operation is taking place by pulling a crystal from a feed melt contained in a crucible, a control rod contained within each of said cylinders and adapted to project into said furnace to enter into the crucible to maintain the baffle plate in the predetermined position under the surface of the feed melt in the crucible, said control rods being disposed in a spatial relationship with a single crystal pulling rod disposed between them, and a drive means for vertically moving said control rods simultaneously to cause same to enter and withdraw from the crucible at the same rate and to assume controllable positions within the crucible, said drive means comprising outside magnets of magnetic drive mechanisms which have inside magnet counter parts disposed in said cylinders, for driving said control rods vertically, and means for rotating said outside magnets simultaneously to simultaneously drive said inside magnet counter parts and said control rods.

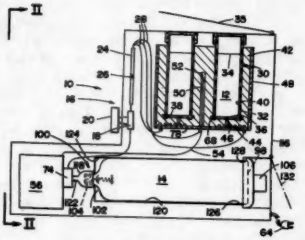
4,604,263
CELL FOR GAS SAMPLE EQUILIBRATOR

Ronald B. Smernoff, Belmont, Calif., assignor to Analytical Products, Inc., Belmont, Calif.

Filed Jun. 17, 1976, Ser. No. 697,268
Int. Cl.[4] G01N *33/50, 1/00*; B01L *11/00*
U.S. Cl. 422—50 **16 Claims**

1. In an apparatus for equilibrating a hydrophilic liquid such as an aqueous solution with a gas composition which comprises a gas vessel having therewithin a gas of a selectable composition at a pressure above ambient atmospheric pressure, flow control means for receiving flow from said vessel and controlling a flow rate therefrom and conduit means leading from said flow control means to a solution cell having therewithin a hydrophilic liquid such as an aqueous solution, improved solution cell means providing extremely fast attainment of gas-solution equilibrium, comprising:

a removable tube of a polymeric material having an open end and a closed end, said closed end comprising a porous polymeric member having a hydrophobic surface, said member being impervious to flow of a hydrophilic liquid therethrough when said tube is filled therewith and positioned vertically with the closed end thereof downwardly

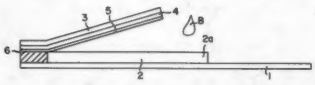


and being permeable to pressurized flow of said gas composition upwardly therethrough.

4,604,264
TEST STRIPS

Anselm Rothe, Birkenau; Wolfgang-Reinhold Knappe, Bürstadt, and Heinz-Friedrich Trasch, Ludwigshafen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Dec. 13, 1983, Ser. No. 560,916
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247608
Int. Cl.[4] G01N *21/78, 33/52*
U.S. Cl. 422—56 **12 Claims**



1. A test strip, comprising:

a carrier layer made of one of a multifilar fabric and fleece;

a dry, reagent-containing film layer coatingly embedded at least preponderantly on and into only one side of the carrier layer; and

a synthetic resin film on the other side of the carrier layer from the preponderance of the reagent film layer.

4,604,265
RECOVERY OF TUNGSTEN AND RHENIUM

Alan D. Douglas; Kenneth T. Reilly, both of Towanda; John E. Landmesser, Monroeton; Richard E. Landry, and Martin B. MacInnis, both of Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 22, 1985, Ser. No. 768,388
Int. Cl.[4] C01G *41/02, 47/00*
U.S. Cl. 423—49 **8 Claims**

1. A process for recovering tungsten and rhenium from a tungsten and rhenium bearing source, said process comprising:

(a) firing said source in an oxidizing atmosphere at a temperature of at least about 650° C. for a sufficient time to convert the tungsten and rhenium to their respective oxides, to remove a portion of the rhenium as volatilized oxide, and to form a first fired material containing essentially all of the tungsten and the remaining portion of the rhenium;

(b) increasing the surface area of the resulting oxidized tungsten to appreciably above 0.5 m^2/g; and

(c) firing said first fired material having increased surface area oxidized tungsten in an oxidizing atmosphere at a temperature of at least about 700° C. for a sufficient time to remove essentially all of said remaining portion of the

rhenium as volatilized rhenium and to form an essentially rhenium-free oxidized tungsten.

4,604,266

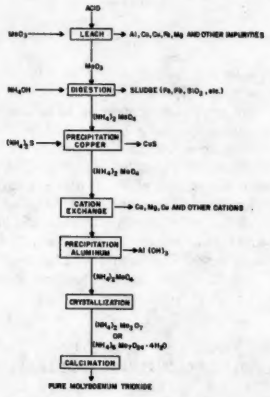
PROCESS FOR PURIFYING MOLYBDENUM TRIOXIDE

Michael J. Cheresnowsky; Timothy A. Brunelli, both of Towanda; Robin W. Munn, Sayre, and Tai K. Kim, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 584,843, Feb. 24, 1984, Pat. No. 4,525,331. This application Mar. 27, 1985, Ser. No. 716,727

Int. Cl.[4] C01G *39/00*

U.S. Cl. 423—54 1 Claim



1. A method for preparing ammonium molybdate having low impurities, of iron from an impure concentrate of molybdenum trioxide consisting of contacting said concentrate with from about 0.85 to less than about one part by weight of an aqueous solution comprising about 4.2 moles per liter of nitric acid and 1.75 moles per liter ammonium nitrate at suitable concentrations to solubilize a major portion of said iron impurity and less than about 0.35 percent of of the molybdenum values from said concentrate, washing the resulting concentrate, for a period of about two hours digesting said resulting concentrate at a temperature of from about 50 to about 60 degrees centigrade with an aqueous solution of ammonium hydroxide at suitable concentrations to solubilize substantially all of the molybdenum values present in said resulting concentrate as ammonium molybdate and form an ammonium molybdate solution, adding an oxidizing agent to said ammonium molybdate solution to oxidize iron values from a plus two to a plus three oxidation state, adjusting pH of said solution to greater than about 9.5 by adding ammonium hydroxide, further digesting for about one to about three hours at around 50° C. to about 60° C. to form an iron precipitate, cooling to about room temperature before liquid-solid separation to decrease iron solubility, separating iron precipitate and sludge from ammonium molybdate solution while maintaining the pH of the molybdate solution above about 9.5, and contacting said resulting ammonium molybdate solution with a chelate iminodiacetate ion exchange resin in ammonium form and concentrating said resulting ammonium molybdate to form ammonium molybdate having low iron impurities.

4,604,267

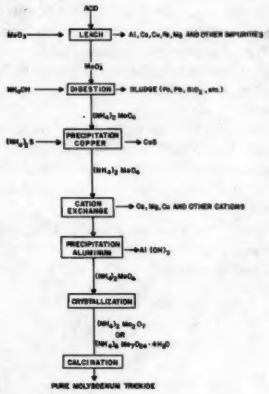
PROCESS FOR PURIFYING MOLYBDENUM TRIOXIDE

Michael J. Cheresnowsky, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 584,845, Feb. 29, 1984, Pat. No. 4,555,386. This application Mar. 27, 1985, Ser. No. 717,068

Int. Cl.[4] C01G *39/00*

U.S. Cl. 423—54 1 Claim



1. A method for preparing ammonium molybdate having low impurities of iron from an impure concentrate of molybdenum trioxide consisting of contacting said concentrate with from about 0.85 parts to about 3 parts by weight of an aqueous solution comprising about 2 to about 2.5 moles per liter nitric acid, 0.5 to 1 mole per liter of ammonium sulfate, and less than about 0.5 moles per liter of ammonium nitrate at suitable concentrations to solubilize a major portion of said iron impurity, and less than about 1.5 percent of the molybdenum values from said concentrate, washing the resulting concentrate, digesting said resulting concentrate at a temperature of from about 50 to about 60 degrees Centigrade for a period of about two hours with an aqueous solution of ammonium hydroxide at suitable concentrations to solubilize substantially all of the molybdenum values present in said resulting concentrate as ammonium molybdate and form an ammonium molybdate solution, adding an oxidizing agent to said ammonium molybdate solution to oxidize iron values from a plus two to a plus three oxidation state, adjusting pH of said solution to greater than about 9.5 by adding ammonium hydroxide, further digesting for about one to about three hours at around 50° C. to 60° C. to form an iron precipitate, cooling to about room temperature before liquid-solid separation to decrease iron solubility, separating iron precipitate and sludge from ammonium molybdate solution while maintaining the pH of the molybdate solution above about 9.5 and contacting said resulting ammonium molybdate solution with a chelate iminodiacetate ion exchange resin in ammonium form and concentrating said resulting ammonium molybdate to form ammonium molybdate having low iron impurities.

4,604,268

METHODS OF DESULFURIZING GASES

Alan R. Kay, Burlington, Canada, and William G. Wilson, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 521,751, Aug. 8, 1983, Pat. No. 4,507,149, which is a continuation-in-part of Ser. No. 471,773, Mar. 3, 1983, which is a continuation of Ser. No. 174,024, Jul. 31, 1980, Pat. No. 4,397,683. This application Apr. 2, 1985, Ser. No. 718,989

Int. Cl.[4] B01D *53/36*

U.S. Cl. 423—230 9 Claims

1. A method for desulfurizing gases containing hydrogen formed by the incomplete combustion of sulfur containing hydrocarbons at high temperature in which gases the sulfur is mainly in the form of one of hydrogen sulfide and sulfur carbonyl whereby the sulfur is removed to sufficiently low levels that when combustion of the gases is completed the gases emitted into the atmosphere have a sulfur content which is less than one pound of sulfur per million British thermal units produced by combustion of fuel or its equivalent comprising the steps of:

a. Controlling the incomplete combustion of the sulfur containing hydrocarbons so that the ratio of carbon monoxide to carbon dioxide (CO/CO_2) ratio at standard conditions (32 F. and one atmosphere pressure) is greater than one; and

b. Reacting the gases whose CO/CO_2 ratio is greater than one and whose sulfur content is in the form of one of H_2S and sulfur carbonyl (COS) with cerium oxide.

4,604,269

FLUE GAS DESULFURIZATION PROCESS

Heeyoung Yoon, McMurray, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed Mar. 22, 1985, Ser. No. 714,750

The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.

Int. Cl.[4] C01B *17/00;* B01J *8/00*

U.S. Cl. 423—242 2 Claims

1. The method of reducing sulfur dioxide content of a flue gas resulting from combustin of sulfur-containing fuel, which method comprises:

(a) mixing into said flue gas, at a point where its temperature is between about 120° and about 230° C., a finely divided dry sorbent comprising alkaline earth metal oxide slaked with an aqueous solution of solubilizing agent, said sorbent being added in amount sufficient to provide a metal salt: sulfur ratio of at least about 0.5, said alkaline earth metal being selected from calcium and magnesium and said solubilizing agent being selected from sodium hydroxide, sodium carbonate, calcium chloride, adipic acid and glycerol;

(b) spraying into the resulting suspensio of sorbent in flue gas a humidifying agent selected from water and steam;

(c) providing a contact time between said flue gas and droplets resulting from said spraying of at least about 1 second;

(d) subsequently separating from said flue gas solids resulting from addition of said sorbent and solids resulting from combustion of said fuel;

(e) discharging from said separating a flue gas of substantially diminished sulfur dioxide content; and

(f) regulating the rate of said spraying relative to the rate of said flue gas such that the temperature of said flue gas at the point of said separating is between about 10° C. and about 30° C. above its saturation temperature.

4,604,270

SCAVENGERS FOR THE REMOVAL OF IMPURITIES FROM INERT FLUIDS

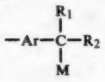
Glenn M. Tom, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 655,856, Sep. 28, 1984, which is a continuation-in-part of Ser. No. 493,875, May 12, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 760,869

Int. Cl.[4] C01B *23/00*

U.S. Cl. 423—262 13 Claims

1. A process for the purification of fluids inert to macroreticulate polymer scavengers and containing Lewis acid and oxidant impurities which comprises contacting the fluid with a macroreticulate polymer scavenger to remove said impurities from said fluid, said scavenger comprising a macroreticulate polymer backbone having a plurality of pendant functional groups or a mixture of functional groups corresponding to the general formula:



where Ar is an aromatic hydrocarbon radical containing from one to three rings; R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, alkyl hydrocarbon radicals containing 1 to 12 carbon atoms, methylene-bridged benzophenone radicals, alkali or alkaline earth metal salts of methylene-bridged benzophenone; methylene-bridged fluorenone radicals, and alkali or alkaline earth metal salts of methylene-bridged fluorenone; and M is selected from the group consisting of lithium, potassium, sodium, alkyl magnesium, or alkyl zinc where the alkyl groups are hydrocarbon alkyl radicals containing from 1 to 12 carbon atoms and then separating the thus contacted fluid from the macroreticulate polymer.

4,604,271

MAGNESIUM BOROHYDRIDE DIAMMONIATE AND TRIAMMONIATE

Ross I. Wagner, Woodland Hills, and Louis R. Grant, Los Angeles, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 30, 1985, Ser. No. 781,819

Int. Cl.[4] C01B *35/00*

U.S. Cl. 423—286 3 Claims

1. A process for the conversion of magnesium borohydride dietherate or the deuterated analog dietherate thereof to the thermally stable compound magnesium borohydride di- or triammoniate or the deuterated analogs thereof comprising:

(i) providing a stoichiometric excess amount of a dietherate selected from the group consisting of

$$Mg(BH_4)_2.X(C_2H_5)_2O \text{ and } Mg(BD_4)_2.X(C_2H_5)_2O,$$

wherein D is deuterium and X is a numeral ranging from about 2 to about 2.5, in a reaction solvent selected from benzene and diethyl ether, said reaction solvent being benzene when said dietherate is to be converted to $Mg(BH_4)_2.2NH_3$, $Mg(BD_4)_2.2NH_3$ or $Mg(BH_4)_2.2ND_3$ said reaction solvent being diethyl ether when said dietherate is to be converted to $Mg(BH_4)_2.3NH_3$, Mg $(BD_4)_2.3NH_3$ or $Mg(BD_4)_2.3ND_3$;

(ii) contacting said dietherate in said reaction solvent with an amount from about 90 to about 95% of the stoichiometric amount of gaseous ammonia or its deuterated analog to form a precipitated solid compound which is magnesium borohydride di-or tri- ammoniate or the deuterated analogs thereof;

(iii) separating said precipitated solid compound and washing said precipitated solid compound with said reaction solvent which is diethyl ether when said precipitated solid

compound is magnesium borohydride triammoniate or the deuterated analogs thereof and washing said precipitated solid compound with said reaction solvent which is benzene when said precipitated solid compound is magnesium borohydride diammoniate or the deuterated analog thereof; and,

(iv) recovering said magnesium borohydride di- or triammoniate or the deuterated analogs thereof and drying under vacuum at ambient temperature.

4,604,272

PROCESS FOR THE PREPARATION OF SILICON TETRACHLORIDE

Günter Kratel, Durach-Bechen, and Stefan Loskot, Kempten, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,147

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424978; Oct. 19, 1984, 3438444

Int. Cl.[4] C01B *33/08*

U.S. Cl. 423—343 **18 Claims**

1. In a process for the preparation of silicon tetrachloride of the type including the step of reacting material containing SiO_2 with chlorine in the presence of carbon and catalytic concentrations of a catalyst, the improvement comprising:

(a) said material containing SiO_2 having a BET surface area of more than 0.1 m^2/g;

(b) said carbon having a BET surface area of at least 0.5 m^2/g;

(c) said catalyst comprising at least one halide selected from the group consisting of:

(1) a transition metal halide including iron chloride, iron fluoride, cobalt chloride, cobalt fluoride, nickel chloride, nickel fluoride, chromium chloride, manganese chloride, manganese fluoride, copper chloride, copper fluoride, silver chloride, and silver fluoride, and a combination thereof; and

(2) a chloride of the fifth main or subsidiary group of the Periodic Table; and a combination thereof; and

(d) the reaction temperature is in the range from 500° to 1200° C.

4,604,273

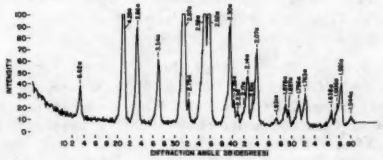
PROCESS FOR THE GROWTH OF ALPHA SILICON NITRIDE WHISKERS

Gary Czupryna; Samuel Natansohn, both of Sharon, Mass.; Robert A. Long, Towanda, and Robin W. Munn, Sayre, both of Pa., assignors to GTE Products Corporation, Stamford, Conn. and GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 19, 1985, Ser. No. 725,043

Int. Cl.[4] C01B *21/068*

U.S. Cl. 423—344 **5 Claims**



1. A method of making silicon nitride whiskers having a purity greater than 99.9% comprising the steps:

Step 1—mixing from about 0.5 to about 10 parts of carbon with one part silicon dioxide forming a mixture;

Step 2—adding from about 0.001 to about 0.5 weight percent of a whisker forming additive to the mixture from step 1, said whisker forming additive being selected from the group consisting of the metal, oxide, salt of chromium, nickel, magnesium, and combinations thereof, said salt being convertible to an oxide by heating;

Step 3—heating the produce from step 2 in a graphite container from about 1400° C. to about 1550° C. for about 2 to about 12 hours in a flowing nitrogen atmosphere at about 0.5 to about 5 cm/sec to form whiskers of alpha silicon nitride having an aspect ratio greater than 10 and a purity greater than 99.9%.

4,604,274

PHOTOCHEMICAL PROCESS FOR THE PREPARATION OF DISILANE

Joshua Zavelovich, Lincolnwood, and David S. Hacker, Evanston, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jul. 18, 1985, Ser. No. 756,188

Int. Cl.[4] C01B *33/04;* B01J *1/10;* B01K *1/00*

U.S. Cl. 204—157.41 **20 Claims**

15. A method for the preparation of disilane which comprises:

(a) introducing silane into a reaction vessel and irradiating at least a portion of said silane with pulsed coherent light having a wavelength in the range from about 10.2 to about 11.2 μm and a fluence in the range from about 0.2 to about 2.0 J/cm^2 wherein said irradiation is carried out at a pressure in excess of about 75 torr and in the absence of a sensitizer; and

(b) separating disilane from the product of (a).

4,604,275

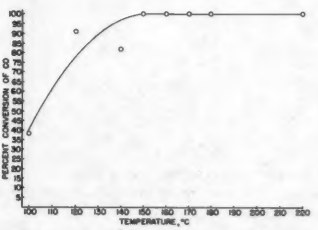
SELECTIVE CATALYTIC OXIDATION OF CARBON MONOXIDE IN HYDROCARBON STREAM TO CARBON DIOXIDE

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 200,242, Oct. 24, 1980, abandoned, which is a continuation of Ser. No. 929,067, Jul. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 799,812, May 23, 1977, abandoned. This application Jul. 27, 1984, Ser. No. 635,339

Int. Cl.[4] B01J *23/74;* C01B *31/20*

U.S. Cl. 423—437 **21 Claims**



1. A method for selectively oxidizing carbon monoxide in a gaseous reaction medium containing a hydrocarbon which comprises:

(a) introducing a gas containing carbon monoxide, hydrocarbon, and, based on the amount of carbon monoxide, a stoichiometric amount or greater of oxygen into an oxidation reaction zone containing a catalytically effective amount of a supported cobalt oxide catalyst prepared by:

(i) impregnating an alumina support with an aqueous solution of a first water soluble alkaline compound whose anion is capable of forming a water insoluble cobalt compound when said first water soluble alkaline compound is reacted with a water soluble cobalt compound, said water insoluble cobalt compound capable of providing a water insoluble cobalt oxide upon calcination,

(ii) drying the support,

(iii) impregnating the support with an aqueous solution of a water soluble cobalt compound whose anion is capable of forming a second water soluble alkaline compound upon reaction of said water soluble alkaline compound with said first water soluble cobalt compound, whereby an insoluble cobalt compound forms on the support,

(iv) calcining the impregnated support to form an insoluble cobalt oxide on said support,

(v) washing the calcined support with water to remove soluble compounds and activate the cobalt oxide catalyst, and

(b) reacting the carbon monoxide and oxygen in said reaction zone at an elevated temperature and for a period of time effective to provide substantially complete conversion of the carbon monoxide to carbon dioxide and no significant oxidation of the hydrocarbon.

4,604,276

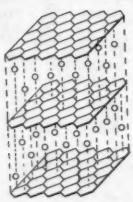
INTERCALATION OF SMALL GRAPHITE FLAKES WITH A METAL HALIDE

Daniel W. Oblas, Bedford, and Sophia R. Su, Weston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 19, 1983, Ser. No. 533,512

Int. Cl.[4] C01B *31/02*; H01B *1/06*

U.S. Cl. 423—449 **11 Claims**



1. A method of intercalating small graphite flakes with an electron-acceptor metal halide, comprising:

placing said graphite flakes in a first zone of a two zone vapor transport reactor;

placing said metal halide in a second zone of said reactor;

charging said reactor with an intercalation-promoting halogen gas;

supplying heat to the second zone of said reacotr to provide a temperature therein sufficient to vaporize said metal halide and produce a partial pressure of the metal halide sufficent to promote intercalation;

supplying sufficient heat to the first zone of said reactor to provide a temeprature therein slightly elevated with regard to the temperature in said second zone and sufficient to prevent condensation of the metal halide on the graphite;

slowly rotating said reactor about its horizontal axis while supplying heat to the second zone of said reactor and to the first zone of said reactor; and

maintaining said reaction conditions until the graphite flakes have been intercalated with said metal halide.

4,604,277

PRODUCTION OF AMMONIUM TETRATHIOTUNGSTATE

Robin W. Munn, Sayre; Kenneth T. Reilly, Towanda, and Henry E. Hoffman, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 16, 1985, Ser. No. 766,222

Int. Cl.[4] C01G *39/00*

U.S. Cl. 423—517 **7 Claims**

1. A process for producing ammonium tetrathiotungstate comprising:

(a) reacting an ammoniacal tungstate solution with hydrogen sulfide gas, said solution and said gas being in a closed system and the flow of said gas being at an elevated pressure to form a slurry consisting essentially of a solid, essentially all of which is ammonium tetrathiotungstate containing a portion of the starting tungsten, and a mother liquor containing the balance of the tungsten;

(b) cooling said slurry to ambient temperature;

(c) separating said solid from the major portion of said mother liquor;

(d) washing said solid with water and with alcohol followed by removing the resulting respective water and alcohol washes to remove the remaining portion of said mother liquor and soluble impurities from said solid; and

(e) drying the resulting washed solid at ambient temperature to form the final ammonium tetrathiotungstate.

4,604,278

PRODUCTION OF AMMONIUM TETRATHIOMOLYBDATE

Kenneth T. Reilly, Towanda; Robin W. Munn, Sayre; Henry E. Hoffman, and Alan D. Douglas, both of Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 17, 1985, Ser. No. 734,985

Int. Cl.[4] C01G *39/00*

U.S. Cl. 423—517 **7 Claims**

1. A process for producing ammonium tetrathiomolybdate comprising:

(a) reacting an ammoniacal molybdate solution with hydrogen sulfide gas, said solution and said gas being in a closed system and the flow of said gas being regulated at an elevated pressure to form a slurry consisting essentially of a solid essentially all of which is ammonium tetrathiomolybdate containing a portion of the starting molybdenum and a mother liquor containing the balance of the molybdenum;

(b) cooling said slurry to ambient temperature;

(c) separating said solid from the major portion of said mother liquor;

(d) washing said solid with water and with alcohol followed by removing the resulting respective water and alcohol washes to remove the remaining portion of said mother liquor and soluble impurities from said solid; and

(e) drying the resulting washed solid at ambient temperature to form the final ammonium tetrathiomolybdate.

4,604,279

PROCESS FOR PRODUCING OZONE

Ortwin Leitzke, Kaarst, and Ewald Wolf, Karben, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt, Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,030

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3434169

Int. Cl.[4] C01B *13/10*

U.S. Cl. 423—581 **6 Claims**

1. In a process for producing ozone in which the ozone is produced from oxygen in an ozone generator, wherein said ozone is separated from the oxygen not converted into ozone in a pressure swing adsorber during an adsorption phase under reduced pressure and at ambient temperature, and the oxygen

not converted into ozone is returned to the ozone generator, after which the adsorbed ozone is drawn off from the pressure swing adsorber during a desorption phase under lower than atmospheric pressures which are created by a vacuum-generating machine which employs a flowing medium for generating the vacuum, and said ozone is mixed with the flowing medium, the improvement comprising passing the ozone from the pressure swing adsorber through an equalizing tank which reduces the pressure rise at the beginning of the desorption phase and equalizes the ozone concentration in the desorped gas with the equalizing tank being located between the pressure swing absorber and the vacuum generating machine, said equalizing tank being filled at least partially with silica gel, and mixing the ozone from the equalizing tank with the flowing medium.

4,604,280

STABILIZATION OF CARRAGEENAN-CONTAINING TOOTHPASTE

George V. Scott, Scotch Plains, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

Continuation of Ser. No. 406,610, Aug. 6, 1982, Pat. No. 4,473,988, which is a continuation of Ser. No. 87,561, Oct. 24, 1979, Pat. No. 4,353,890. This application Sep. 10, 1984, Ser. No. 648,557

The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.

Int. Cl.[4] A61K *7/16, 41/00;* **A61L** *2/12;* **B01J** *1/10*

U.S. Cl. 424—49 **4 Claims**

1. A process for stabilizing a cosmetic composition containing carrageenan as a gelling agent, which comprises directing microwave radiation onto such composition in such quantity as to raise the temperature thereof to at least the gel-sol transition temperature of the carrageenan, and quiescently cooling the dentifrice from such gel-sol transition temperature to produce gelation thereof.

4,604,281

COSMETIC AND SKIN TREATMENT COMPOSITIONS CONTAINING ACETYLATED STEROLS

George E. Deckner, Westfield; Clara G. Mercado, Aberdeen, and Ann M. Krog, Eatontown, all of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Continuation-in-part of Ser. No. 477,562, Mar. 21, 1983, abandoned. This application Sep. 4, 1984, Ser. No. 646,409

Int. Cl.[4] A61K *7/42, 7/021, 47/00*

U.S. Cl. 424—59 **9 Claims**

1. A skin care preparation consisting essentially of at least one acetylated soya bean derived sterol which is acetylated sitosterol, acetylated campesterol or acetylated stigmasterol or a mixture thereof, and is exclusive of acetylated cholesterols, in an amount within the range of from about 0.1 to about 10% by weight which serves as an emollient to impart the above properties to the skin preparation, at least one emulsifier, at least one humectant, at least one diluent, and at least one preservative.

2. The skin care preparation as defined in claim 1 in the form of a cosmetic which is a foundation makeup.

3. The skin care preparation as defined in claim 2 including at least one coloring agent or pigment and at least one sun screen agent.

4,604,282

CAPILLARY COSMETIC COMPOSITION CONTAINING A SARSAPARILLA EXTRACT

Jean-Francois Grollier, Paris, and Josiane Allec, Pierrefitte, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 146,371, May 2, 1980, abandoned. This application Aug. 27, 1982, Ser. No. 412,270

Claims priority, application Luxembourg, May 15, 1979, 81257

Int. Cl.[4] A61K *7/06;* **C11D** *9/22, 15/04*

U.S. Cl. 424—74 **3 Claims**

1. A method for washing the hair, comprising applying thereto an effective amount, so as to completely impregnate the hair, of a composition containing in an aqueous carrier from 0.1 to 20 weight percent of a sarsaparilla dry extract obtained from the ground roots of *Smilax medica,* said extract containing saponins, the sapogenin of said saponins having a steroidic structure, and said composition having a pH between 4 and 8.

4,604,283

HOOF CONDITIONER AND DRESSING AND METHODS OF USE

Anne L. Gresham, 5809 Warren Farm Rd., Rte. 2, Hiram, Ga. 30141

Continuation of Ser. No. 603,785, Apr. 24, 1984, abandoned. This application Jul. 17, 1985, Ser. No. 756,923

Int. Cl.[4] A61K *31/79, 33/18*

U.S. Cl. 424—80 **1 Claim**

1. A composition for treatment of horse hooves consisting of the following ingredients in percentages by volume:

Petrolatum	40%
Anhydrous Lanolin, U.S.P.	25%
Veterinary grade cod liver oil, fortified with 275μ vitamin A per ounce and 750μ vitamin D per ounce	12.5%
Veterinary grade wheat germ oil, fortified with 30,000μ vitamin A per ounce, 5000μ vitamin D per ounce and containing 100μ vitamin E per ounce	12.5%
Urea in a 20% by volume aqueous solution	5%
[Betadine ® 10% Povidone-Iodine solution] 10% Povidone-Iodine solution	5%

4,604,284

HOMOGENEOUS IMMUNE INTERFERON FRAGMENT

Hsiang-Fu Kung, Verona, N.J.; Hiromu Sugino, Hyogo, and Susumu Honda, Osaka, both of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J. and Takeda Chemical Industries Ltd., Osaka, Japan

Filed Sep. 20, 1983, Ser. No. 534,038

Int. Cl.[4] A61K *37/02;* **C07K** *13/00;* **C12P** *21/00*

U.S. Cl. 424—85 **4 Claims**

1. A gamma interferon polypeptide fragment species with the amino acid sequence of the formula:

Cys Tyr	Cys Gln	Asp Pro	Tyr Val	Lys Glu	Ala Glu
Asn Leu	Lys Lys	Tyr Phe	Asn Ala	Gly His	Ser Asp
Val Ala	Asp Asn	Gly Thr	Leu Phe	Leu Gly	Ile Leu
Lys Asn	Trp Lys	Glu Glu	Ser Asp	Arg Lys	Ile Met
Gln Ser	Gln Ile	Val Ser	Phe Tyr	Phe Lys	Leu Phe
Lys Asn	Phe Lys	Asp Asp	Gln Ser	Ile Gln	Lys Ser
Val Glu	Thr Ile	Lys Glu	Asp Met	Asn Val	Lys Phe
Phe Asn	Ser Asn	Lys Lys	Lys Arg	Asp Asp	Phe Glu
Lys Leu	Thr Asn	Tyr Ser	Val Thr	Asp Leu	Asn Val
Gln Arg	Lys Ala	Ile His	Glu Leu	Ile Gln	Val Met
Ala Glu	Leu Ser	Pro Ala	Ala Lys	Thr Gly	Lys

wherein the polypeptide has substantially the same activity as intact gamma interferon.

4. A composition useful in the prophylaxis or treatment of viral, neoplastic or immunosuppressive disorders comprising a therapeutically inert pharmaceuticlly acceptable carrier and a therapeutically effective amount of a polypeptide with the amino acid sequence of the formula:

Cys Tyr	Cys Gln	Asp Pro	Tyr Val	Lys Glu	Ala Glu
Asn Leu	Lys Lys	Tyr Phe	Asn Ala	Gly His	Ser Asp

-continued

Val	Ala	Asp Asn	Gly Thr	Leu Phe	Leu Gly	Ile Leu
Lys	Asn	Trp Lys	Glu Glu	Ser Asp	Arg Lys	Ile Met
Gln	Ser	Gln Ile	Val Ser	Phe Tyr	Phe Lys	Leu Phe
Lys	Asn	Phe Lys	Asp Asp	Gln Ser	Ile Gln	Lys Ser
Val	Glu	Thr Ile	Lys Glu	Asp Met	Asn Val	Lys Phe
Phe	Asn	Ser Asn	Lys Lys	Lys Arg	Asp Asp	Phe Glu
Lys	Leu	Thr Asn	Tyr Ser	Val Thr	Asp Leu	Asn Val
Gln	Arg	Lys Ala	Ile His	Glu Leu	Ile Gln	Val Met
Ala	Glu	Leu Ser	Pro Ala	Ala Lys	Thr Gly	Lys

4,604,285

PROTEIN C ENZYME DERIVATIVES

Richard A. Smith, and Robert Cassels, both of Reigate, England, assignors to Beecham Group p.l.c., England

PCT No. PCT/GB84/00239, § 371 Date Mar. 18, 1985, § 102(e) Date Mar. 18, 1985, PCT Pub. No. WO85/00521, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 4, 1984, Ser. No. 717,269

Claims priority, application United Kingdom, Jul. 20, 1983, 8319538

Int. Cl.[4] **A61K** *37/48;* **C07K** *3/08;* **C12N** *9/96, 9/99*

U.S. Cl. 424—94 **8 Claims**

1. An enzyme derivative comprising Protein Ca in which the active site essential for anti-coagulant activity is blocked by an acyl group which is removable in vivo by enzymatic hydrolysis to provide a sustained and controlled release of Protein Ca.

4,604,286

INFUSION SOLUTION FOR PARENTERAL NUTRITION

Seizo Kawajiri, Nagaokakyo, Japan, assignor to Daigo Nutritive Chemicals, Ltd., Osaka, Japan

Filed Sep. 17, 1984, Ser. No. 652,221

Int. Cl.[4] **A61K** *31/70, 31/195, 33/06, 33/14, 33/20*

U.S. Cl. 424—149 **3 Claims**

1. An aqueous infusion solution for parenteral nutrition containing dextrose, amino acids and electrolytes in the form of salts of sodium, potassium, magnesium, calcium, phosphate and chlorine in the solution, wherein

the pH of the solution is 4.5–5.5,

said compounds being in the form of salts with hydrochloric acid, phosphoric acid, sulfuric acid and latic acid,

the pH adjustment is effected by the use of an acid selected from the group consisting of hydrochloric acid, phosphoric acid, sulfuric acid and lactic acid,

the content of dextrose is 3–10 W/V %,

the content of amino acids is as follows:

Amino acid	Concentration (g/l)
L-Methionine	1.09–3.27
L-Isoleucine	1.61–4.83
L-Leucine	2.02–6.06
L-Phenylalanine	1.12–3.36
L-Valine	1.45–4.35
L-Threonine	0.81–2.43
L-Lysine.HCl	1.46–4.38
L-Tryptophan	0.32–0.96
L-Alanine	0–4.59
L-Arginine	0–5.76
L-Histidine	0–1.74
L-Proline	0–6.78
L-Serine	0–3.60
Amino acetic acid	0–7.80
L-Cysteine HCl	0.0.09

and

the concentrations (as mEq/1) of the electrolytes including the acids used for the pH adjustment and f the hydrochlorides, if any, of the amino acid(s) are as follows:

Na^+	30–60
K^+	20–35
Mg^+	0–5
Ca^{++}	0–5
HPO_4^{--}	0–10
Cl^-	30–70
SO_4^{--}	0–5

and said solution further containing at least one of sodium lactate, calcium lactate or lactic acid in a concentration of 10–50 mEq/1 and said solution being free from any organic acid or its salt other than lactic acid or is salt.

4,604,287

MULTIPLE TEXTURED CHEWING GUM

Michael Glass, Fairlawn; Joseph Hoholick, Bridgewater; Alfred Oppenheimer, Randolph, and Amy Dombroski, Budd Lake, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 7, 1985, Ser. No. 742,279

Int. Cl.[4] **A23G** *3/30*

U.S. Cl. 426—5 **14 Claims**

1. A chewing gum composition having a short, soft non-elastic texture which comprises a substantially anhydrous mixture of a gum base, sweetening agent, from about 5 to about 18% by weight of a softener and a maltodextrin binder, the latter present in the amount of amount 0.75% to about 6% by weight having a DE value of about 7 to about 27 wherein the composition converts upon chewing to an elastic-cohesive chewing gum.

4,604,288

PROCESS FOR PREPARING A CHEWING GUM COMPOSITION WITH IMPROVED FLAVOR PERCEPTION

Michael Glass, Fairlawn; Vincent Corsello, Cedar Knolls, both of N.J.; Daniel A. Orlandi, Flushing, and Anthony Guzowski, Maspeth Queens, both of N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 23, 1985, Ser. No. 737,299

Int. Cl.[4] **A23G** *3/30*

U.S. Cl. 426—5 **11 Claims**

1. The process of making an organoleptically pleasant chewing gum composition free of harsh or bitter flavor notes comprising:

(a) forming a premix comprising particulate lecithin present in the amount of about 8 to about 25%, a liquid or semi-liquid flavor present in amounts of about 75 **to about** 92%, all percents being based on the total weight of the premix;

(b) mixing the premix of (a) with an effective amount of sweetener;

(c) further mixing the resultant mixture of (b) with a gum base comprising elastomers and softeners to obtain a homogeneous mass.

4,604,289

PROCESS FOR PREPARING WHOLE WHEAT BREAD AND MIX FOR SAME

Henry C. Spanier, West Milford, N.J.; Albert Spiel, Yonkers, N.Y., and Gary M. J. Rinaldo, Landing, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Nov. 7, 1983, Ser. No. 549,419

Int. Cl.[4] **A21D** *8/00*

U.S. Cl. 426—19 **34 Claims**

1. Whole wheat bread mix characterized by its ability to form a high quality whole wheat bread in less than two hours from addition of water to completion of baking, comprising:

(a) a stone-ground fine grain whole wheat flour, 40 to 75 percent by weight of the whole wheat flour passing through a +100 U.S. series mesh screen;

(b) about 2 to about 10 percent by weight, based on the weight of the mix, of added vital gluten;
(c) about 2 to about 3.5 percent by weight, based on the weight of the mix, of sucrose;
(d) about 2 to about 3.5 percent by weight, based on the weight of the mix, of dextrose, the ratio of dextrose to sucrose being between about 0.57 to about 1.75;
(e) about 1.5 to about 4 percent by weight, based on the weight of the mix, of a quick-leavening active dry yeast; and
(f) about 0.1 to about 0.75 percent by weight based on the weight of the mix, of a dough conditioner selected from the group consisting of calcium stearoyl-2-lactylate, sodium stearoyl-2-lactylate and a mixture of at least two of said lactylates.

4,604,290
MEAT FLAVORING AGENTS AND PROCESS FOR PREPARING SAME

Eldon C. Lee; Pierre J. van Pottelsberghe de la Potterie, both of New Milford, and John S. Tandy, Kent, all of Conn., assignors to Nestec S.A., Vevey, Switzerland

Filed Sep. 1, 1983, Ser. No. 528,561
Int. Cl.[4] A23L *1/226, 1/231*
U.S. Cl. 426—533 **10 Claims**

1. A process for preparing a flavorant for imparting cooked meat or fish flavor to foodstuffs which comprises:
(a) oxidizing a lipid material selected from the group consisting of triglycerides, unsaturated fatty acids and combinations thereof by contacting the lipid material with an oxidizing agent to form oxidation products, the extent of such oxidation corresponding to oxidation of the lipid material to a peroxide value between about 5 and about 150 milliequivalents per kilogram of lipid material;
(b) forming a reaction mixture before or after said oxidizing step by combining the lipid material with a source of amino acids capable of reacting with said oxidation products and with a sulfur-containing compound capable of reacting with said oxidation products, the amounts of said sulfur-containing compound and said amino acids together being sufficient to react with essentially all of the oxidation products produced in said oxidizing step, said amino acid source including an animal protein hydrolysate; and
(c) reacting said mixture until substantially all of said oxidation products have been consumed and the peroxide value of the reaction mixture is substantially zero thereby forming the flavorant, said oxidizing step being performed before or during said reacting step.

4,604,291
METHOD FOR MANUFACTURE OF ALUMINUM-COATED LEAD FRAME

Yen-Ching Huang, Ohiso, and Hideyasu Nikaido, Oume, both of Japan, assignors to Tokai University and Sumitomo Metal Mining Company Limited, both of Tokyo, Japan

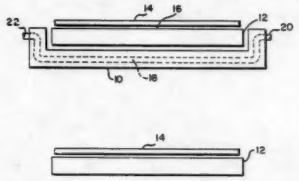
Filed Aug. 26, 1985, Ser. No. 769,470
Claims priority, application Japan, Aug. 31, 1985, 59-182210
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—37 **4 Claims**

1. A method for the manufacture of an aluminum-coated lead frame for semiconductor integrated circuit devices, said method including the steps of covering said lead frame with a mask sheet possessing an opening for exposing an inner lead part of said lead frame, maintaining said lead frame at a temperature in a range of 100° to 240° C. and under a high degree of vacuum exceeding the level of 10^{-5} Torr, and deposing aluminum on said inner lead part by arc-discharge type ion plating.

4,604,292
X-RAY MASK BLANK PROCESS

Robert D. Evans, Bedford, and Ward D. Halverson, Cambridge, both of Mass., assignors to Spire Corporation, Bedford, Mass.

Filed Apr. 26, 1985, Ser. No. 727,782
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 **10 Claims**

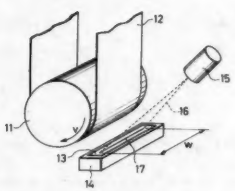


1. A process of growing a membrane for use as an X-ray mask blank comprising:
(a) providing a mounting fixture;
(b) providing a substrate on said mounting fixture;
(c) lowering the temperature of said substrate to about the boiling point of hydrogen by cooling said mounting fixture;
(d) depositing a membrane on said substrate while the same is being maintained at about said cooled temperature;
(e) removing said substrate and the thereon deposited membrane from said mounting fixture; and
(f) allowing said substrate to rise to ambient temperature.

4,604,293
PROCESS FOR PRODUCING MAGNETIC RECORDING MEDIUM

Ryuji Shirahata, and Akio Yanai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1985, Ser. No. 788,177
Claims priority, application Japan, Oct. 16, 1984, 59-216922; Oct. 16, 1984, 59-216923
Int. Cl.[4] H01F *10/02*
U.S. Cl. 427—42 **9 Claims**



1. A process for producing a magnetic recording medium comprising the steps of heating a magnetic material evaporation source with at least one scanning electron beam and depositing a vapor of a magnetic material emitted from said magnetic material evaporation source onto a non-magnetic substrate continuously moving in a vacuum atmosphere, said magnetic material evaporation source being disposed substantially parallel to the width direction of said non-magnetic substrate to form a magnetic thin film on said substrate, wherein the scanning frequency of said electron beam(s) is at least about 2wv/n Hz, in which v m/min is the moving speed of the non-magnetic substrate; w m is the scanning width of the electrom beam(s) on said magnetic material evaporation source; and n is the number of said electron beam(s).

4,604,294

PROCESS FOR FORMING AN ORGANIC THIN FILM

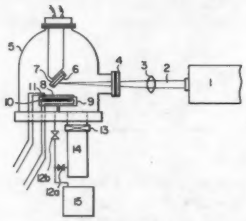
Masahiro Tanaka, Yokohama; Kazufumi Azuma, Hiratsuka; Kazuo Nate, Machida, and Mitsuo Nakatani, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,230

Claims priority, application Japan, Oct. 14, 1983, 58-190898; Nov. 30, 1983, 58-224184; Apr. 16, 1984, 59-75067

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—53.1 **23 Claims**



1. A process for forming an organic thin film on a substrate by vacuum vapor deposition, which comprises exposing an organic compound as a vapor source to a laser beam having an energy level corresponding to that of the chemical bond of the organic compound in vacuum, to break the chemical bond and form vapors from said organic compound, and sputtering the organic compound vapors in vacuum onto a substrate surface and forming a film consisting essentially of the organic compound thereon.

4,604,295

VISIBLE LIGHT ABSORBING PEROXY-ESTERS

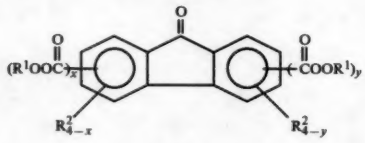
Robert W. R. Humphreys, Bergenfield, N.J., assignor to Loctite Corporation, Newington, Conn.

Filed Dec. 22, 1983, Ser. No. 564,150

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—54.1 **24 Claims**

1. A peroxy compound having the general formula:



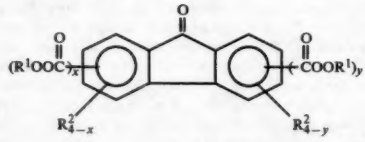
where

R^1 is alkyl, aralkyl, alkoxalkyl, alkenyl, alkynyl or carboxyalkyl;

R^2 is any group which does not cause spontaneous decomposition of the peroxy group;

x and y are integers between 0 and 4 and x + y is greater than or equal to 1.

19. A method of curing a free radically polymerizable formulation comprising an olefinically unsaturated compound and a compound of the formula:



wherein

R^1 is alkyl, aralkyl, alkoxyalkyl, alkenyl, alkynyl, carboxyalkyl, or carboxaryl;

R^2 is any group which does not cause spontaneous decomposition of the peroxy groups;

x and y are integers between 0 and 4 and x plus y is greater than or equal to 1,

the method comprising exposing the formulation to visible light for sufficient time to cure the formulation.

4,604,296

PROCESS FOR PRODUCTION OF MAGNETIC RECORDING ELEMENTS

Masashi Aonuma, and Yasuo Tamai, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 193,320, Oct. 2, 1980, abandoned. This application Nov. 20, 1984, Ser. No. 673,457

Claims priority, application Japan, Oct. 2, 1979, 54-126967

Int. Cl.[4] H01F *10/02*

U.S. Cl. 427—57 **20 Claims**

1. In a process for producing a magnetic recording element by preparing a coating composition including ferromagnetic metal fine powders that are mainly composed of iron and are produced by a dry reduction method, and coating said composition on a non-magnetic support to provide a magnetic recording layer, the improvement which comprises washing said ferromagnetic metal fine powders with water, methanol, water plus ethanol, water plus acetone, or a mixture thereof before preparing the coating composition, wherein said washing is carried out until the conductivity of an aqueous solution obtained after irradiation of a mixture of 1 part by weight of the ferromagnetic metal fine powder and 20 parts by weight of water with supersonic waves at 29 KHz for five minutes and removal of the fine powder from the mixture is 50 m /cm or less.

4,604,297

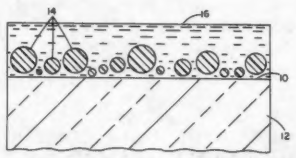
TRANSMISSION ENHANCING COATING

Peter D. Liu, 70 Marcellus Rd., Newton, Mass. 02159

Continuation-in-part of Ser. No. 636,369, Jul. 31, 1984, Pat. No. 4,582,761. This application Jan. 7, 1985, Ser. No. 689,388

Int. Cl.[4] B05D *5/06, 5/12;* **B05B** *5/00*

U.S. Cl. 427—64 **9 Claims**



1. A method of improvement of light transmission through a reflective/transmissive surface comprising external surface irregularities, said method comprising

first creating said surface irregularities by providing an anti-glare dispersion of polyvinyl acetate particulates and water, applying said dispersion and allowing the dispersion to dry to form a coating that reduces reflected glare at said surface, while allowing transmission of light through the surface to permit viewing of objects behind the surface, and then

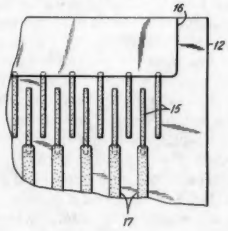
applying an inert liquid coating sufficiently thick to remove at least some, but not all, of the anti-glare effect of the surface irregularities.

4,604,298

FINGER LINE SCREEN PRINTING METHOD AND APPARATUS

Victor Shevtchuk, Trenton; Nhut Chau, Jackson, both of N.J., and Richard C. Schuessler, Levittown, Pa., assignors to Gulton Industries, Inc., East Greenwich, R.I.

Filed Feb. 12, 1985, Ser. No. 700,683
Int. Cl.[4] H05K 3/06
U.S. Cl. 427—96 7 Claims



1. A method of screen printing a conductive ink onto a substrate to form a pattern of conductive lines adapted to be narrow and closely spaced, said method comprising the steps:

leaving said conductive ink exposed to air until said ink has a viscosity ranging from 700,000 to 900,000 centipoise at 70° Fahrenheit,

said air having temperature ranging from 65° to 75° Fahrenheit, and

after said exposure forcing said ink through a screen onto said substrate, said screen being a thin metallic sheet having a pattern of apertures.

4,604,299

METALLIZATION OF CERAMICS

Michael A. De Luca, Holbrook, and John F. McCormack, Roslyn Heights, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 502,748, Jun. 9, 1983, abandoned. This application May 10, 1984, Ser. No. 607,874
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—98 32 Claims

22. Method of making a printed circuit on a surface of a ceramic substrate comprising:

treating the ceramic substrate with a molten alkali metal compound to adhesion promote or etch the surface;

exposing the surface to acidic halide solution containing one or more halides selected from the group consisting of chlorides, bromides, and iodides having an acidity and a halide concentration sufficient to eliminate bare spots in an adherent metal layer formed on the surface or selected parts thereof, wherein the acidic halide solution contains at least 1.5 moles of halide per liter;

treating the ceramic surface with a catalyst for electroless metal deposition;

depositing metal onto the catalyzed surface; and

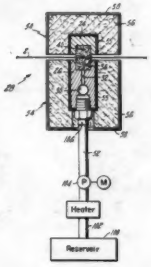
removing portions of the deposited metal to produce a metal printed circuit conductor pattern adhering to the surface of the ceramic substrate.

4,604,300

METHOD FOR APPLYING HIGH SOLIDS ENAMELS TO MAGNET WIRE

Steven F. Keys, Columbia City, and Dennis L. Peppler, Fort Wayne, both of Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 3, 1985, Ser. No. 719,395
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—120 5 Claims



1. A method for applying a polyvinyl butyral magnet wire enamel coating to magnet wire comprising:

heating a high solids polyvinyl butyral enamel coating material to reduce its viscosity to about 200 cps or less,

introducing the heated coating material into a heated applicator die wherein the heated coating material is wicked onto felt applicators,

passing a wire through the heated applicator and contacting said wire with the felt applicators, thereby coating the wire with a layer of enamel from about 0.03 to about 0.16 mil thick,

passing the coated wire through a means for curing the enamel coating forming the enamel coated magnet wire, wherein the enamel viscosity is maintained below 200 cps until applied to the wire, resulting in reduced defects in coils containing such wire.

4,604,301

PROCESS FOR PREPARING DIAPHRAGM-DEPOSITED ACTIVATED CATHODES

Karl Tari, Buffalo; Tilak V. Bommaraju, and Charles G. Rader, both of Grand Island, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,933
Int. Cl.[4] B05D 5/12; C25B 11/10
U.S. Cl. 427—123 16 Claims

1. A process for preparing a diaphragm-deposited activated cathode comprising the steps of

(a) placing an activated cathode in a slurry of fibrous material,

(b) depositing a uniform mixture of said fibrous material onto the cathode by means of a vacuum,

(c) removing the cathode from the slurry and heating the cathode to a temperature of from about 50° C. to about 500° C. in an atmosphere consisting essentially of an inert gas or hydrogen to bake or sinter the fibrous material, and

(d) cooling the cathode to about room temperature.

4,604,302

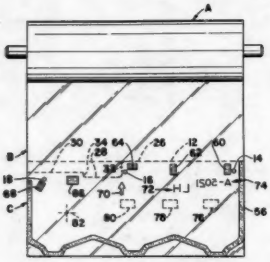
METHOD OF MANUFACTURING WATER DEFLECTOR FOR VEHICLE DOORS

Robert A. Isaksen, Chardon; David E. Frappier, Mayfield Hts., and Wallace R. Jones, Waite Hill Village, all of Ohio, assignors to The Excello Specialty Company, Cleveland, Ohio

Division of Ser. No. 415,228, Sep. 7, 1982, Pat. No. 4,469,732. This application May 21, 1984, Ser. No. 612,414

Int. Cl.[4] B32B *31/18*

U.S. Cl. 427—208.6 4 Claims



1. A method of manufacturing water deflectors for application to the inner panels of vehicle doors comprising the steps of:

providing flat and flexible sheets of plastic material;

applying permanently plastic pressure sensitive adhesive to one face of each said sheet to cover a minor portion thereof in a pattern different from the peripheral shape of each said sheet and forming the outline of a desired configuration of a water deflector for application to the inner panel of a vehicle door;

curing said sheets for substantially permanently bonding said adhesive to said one face;

placing a plurality of said sheets on top of one another in a commonly oriented stacked relationship; and,

die cutting said stacked sheets generally along said desired configuration outwardly of said adhesive.

4,604,303

POLYMER COMPOSITION CONTAINING AN ORGANIC METAL COMPLEX AND METHOD FOR PRODUCING A METALLIZED POLYMER FROM THE POLYMER COMPOSITION

Makoto Takakura; Susumu Kondo, and Tatsuya Nogami, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed May 4, 1984, Ser. No. 607,214

Claims priority, application Japan, May 11, 1983, 58-82170; May 11, 1983, 58-82171; Mar. 23, 1984, 59-55565; Mar. 23, 1984, 59-55566; Apr. 2, 1984, 59-65627

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—229 17 Claims

1. A method for producing a metallized polymer, which comprises:

(a) contacting a polymer film comprising a polymer and an organic metal complex wherein the weight ratio of the polymer to the metal of said organic metal complex ranges from about 99.9:0.1 to 80:20, with a metallizing board, wherein said metallizing board has a heat-treated coating thereon comprising said organic metal complex;

(b) forming a metal layer on the surface of said film from the liberated metal from said organic metal complex by heating the polymer film and coated metallizing board of step (a); and

(c) recovering a polymer film with a metallized surface thereon.

4,604,304

PROCESS OF PRODUCING THICK LAYERS OF SILICON DIOXIDE

Lorenzo Faraone, Montgomery Township, Somerset County, and David L. Patterson, Wall Township, Monmouth County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 3, 1985, Ser. No. 751,680

Int. Cl.[4] C23C *16/40*

U.S. Cl. 427—255 8 Claims

1. In a process of providing a thick layer of thermally grown silicon dioxide on a substrate having at least a sufficient thickness of silicon at the surface thereof to form the desired thickness of silicon dioxide, by oxidizing the silicon at an elevated temperature for a time sufficient to form the desired thickness of silicon dioxide, the improvement comprising oxidizing only so much of the silicon as required to form a thin layer of silicon dioxide, depositing a thin layer of silicon over the layer of silicon dioxide, completely oxidizing the silicon layer to increase the thickness of the silicon dioxide layer, and repeating the silicon deposition and oxidation steps if and as necessary to achieve a desired thickness of silicon dioxide.

7. A process in accordance with claim 1, wherein the layers of silicon are deposited in the amorphous state by low pressure chemical vapor deposition at a temperature less than about 580° C.

4,604,305

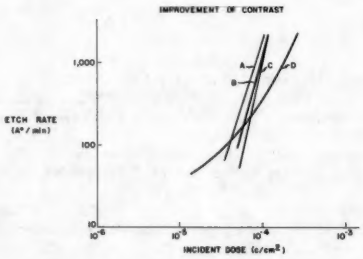
IMPROVEMENTS IN CONTRAST OF A POSITIVE POLYMER RESIST HAVING A GLASS TRANSITION TEMPERATURE THROUGH CONTROL OF THE MOLECULAR WEIGHT DISTRIBUTION AND PREBAKED TEMPERATURE

Harry W. Deckman, Clinton, and John H. Dunsmuir, Annandale, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 629,997, Jul. 12, 1984, abandoned, which is a continuation of Ser. No. 528,178, Aug. 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 426,423, Sep. 28, 1982, abandoned. This application Jul. 31, 1985, Ser. No. 760,936

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—385.5 5 Claims



1. A method of increasing the contrast of a positive polymer resist having a glass transition temperature comprising:

A. obtaining a narrow molecular weight fraction positive polymer resist having $1<M_w/M_n<1.5$ and $M_w<500{,}000$ wherein M_w=weight-average molecular weight and M_n=number-average molecular weight, said resist dissolved in a solvent;

B. coating a substrate with said narrow fraction resist such that a portion of said solvent remains trapped in said coating; and

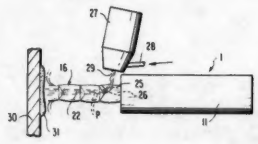
C. baking said narrow fraction resist coated substrate at a temperature above the glass transition temperature such that said solvent is removed from said coating.

4,604,306

ABRASIVE BLAST AND FLAME SPRAY SYSTEM WITH PARTICLE ENTRY INTO ACCELERATING STREAM AT QUIESCENT ZONE THEREOF

James A. Browning, P.O. Box 6, Hanover, N.H. 03755

Filed Aug. 15, 1985, Ser. No. 765,987
Int. Cl.[4] B05B *1/06, 1/24;* B05D *1/10*
U.S. Cl. 427—423 10 Claims



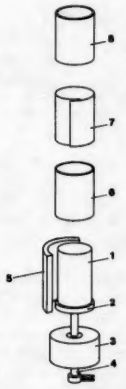
1. An improved flame spray method comprising the steps of: forming a primary jet stream of particulate material suspended in a carrier gas; forming a high velocity gaseous jet of non-circular geometry with a quiescent zone extending from the outer edge of the projected, to be formed circular jet, to well into the center of said jet, and introducing said stream of particulate material into said quiescent zone for subsequent acceleration of the particulate matter to high velocity and concentration thereof at the center of the accelerating stream wherein dynamic forces draw the non-circular flow of gases into a singular circular jet beyond said quiescent zone, capturing the particulate matter introduced within the quiescent zone.

4,604,307

TUBULAR OBJECT OF A LAYERED PLASTICS MATERIAL AND A METHOD FOR THE MANUFACTURE THEREOF

Harm R. Spreeuwers, Heelsum, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jun. 25, 1984, Ser. No. 624,289
Claims priority, application Netherlands, Jul. 18, 1983, 8302560
Int. Cl.[4] B29C *17/07*
U.S. Cl. 428—35 13 Claims



1. A layered, rigid, dimensionally stable tubular object for packaging and transporting chemicals, beverages, foodstuffs and the like, comprising a first layer of 50 to 1000 μm thickness, a film-shaped interlayer and a second layer of 75 to 1000 μm thickness, said first and second layers being of axially and radially molecular oriented polyethylene terephthalate, said first layer forming the inner wall of the object and said second layer being shrunk onto and clamping the interlayer onto the first layer, said first layer and second layer being of substantially the same thickness and, further, thermally stabilized up to a degree of crystallization of at least 25%.

4,604,308

THERMOSETTING POWDER LACQUER FOR COVERING WELD SEAMS

Hans R. Widmer, Hombrechtikon, and Christian Schmid, Meilen, both of Switzerland, assignors to Vernicolor AG, Grüningen, Switzerland

Division of Ser. No. 586,330, Mar. 5, 1984, Pat. No. 4,549,000.
This application Aug. 7, 1985, Ser. No. 763,239
Claims priority, application Switzerland, Mar. 9, 1983, 1264/83
Int. Cl.[4] B27N *5/02*
U.S. Cl. 428—35 10 Claims

1. A metal container comprising:
a weld seam;
an interior weld seam cover;
said weld seam cover comprising a flexible thermoset lacquer; and
said flexible thermoset lacquer essentially consisting of:
a polyaddition product formed by an aromatic epoxide resin mixture including at least two components a first of which contains a maximum of two epoxide groups per molecule on the average and a second of which which contains more than two epoxide groups per molecule on the average;
a hardener selected from the group: condensation product of the diglycidylether of bisphenol-A and bisphenol-A, acidic polyester on the basis of trimellitic acid anhydride and aliphatic polyol, phenolic resin, or a mixture thereof; and
a catalyst.

4,604,309

FOOD CASING WHICH WILL TRANSFER A SMOKE COLOR TO FOOD ENCASED THEREIN AND EXTRACTED NATURAL LIQUID SMOKE COLORANT FOR USE THEREWITH

Michael S. Goldberg, Danville, Ill., assignor to Teepak, Inc., Oak Brook, Ill.

Filed May 19, 1982, Ser. No. 379,795
Int. Cl.[4] A22C *13/00;* A23L *1/22*
U.S. Cl. 428—36 20 Claims

1. A casing for meat products comprising a tube, impregnated with a colorant, said colorant formed by neutralizing an aqueous natural liquid smoke coloring solution, with a solution consisting essentially of water soluble alkaline neutralizing agent, to a pH of from about 6 to about 8 to precipitate a substantial portion of tar materials contained therein and removing said precipitated tar materials.

4,604,310

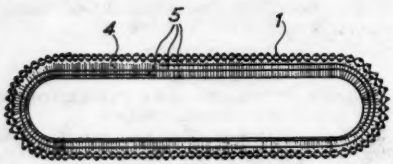
ENDLESS BELTS FOR BATTERY PASTING MACHINES AND METHOD FOR MANUFACTURING THE SAME

Serafino Bertotto, Como, Italy, assignor to Industrie Tessili Bresciane S.P.A., Merone, Italy

Filed Jul. 11, 1984, Ser. No. 629,720
Claims priority, application Italy, Aug. 3, 1983, 22412 A/83
Int. Cl.[4] B32B *5/02*
U.S. Cl. 428—36 14 Claims

1. A seamless endless conveyor belt for battery pasting machine which comprises two layers
(a) an outer layer formed by between 1 and 3 plies of an endless woven fabrics, and
(b) an inner backing layer formed by multi-strata of non-woven webs made of synthetic staple fibres and light woven meshes, said belt being prepared by inserting said

light woven meshes between said outer layer and said non-woven webs and bonding said two layers by needling



whereby the outer layer and the inner layer are bounded together and dewatering channels are formed therethrough to let liquid flow out.

4,604,311

PRECOAT RESIN DISPERSION FOR TUFTED CARPETS

Raymond W. Goss, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 627,705, Jul. 3, 1984. This application Jun. 27, 1985, Ser. No. 749,593

Int. Cl.[4] B32B *3/02, 33/00*

U.S. Cl. 428—96 **18 Claims**

1. A carpet comprising:

(a) a primary backing fabric stitched with loops of yarn on the frontside of the primary backing fabric to form a tufted structure;

(b) a precoat resin dispersion coated on the backside of the primary backing fabric having a solids content from about 63% to about 69% containing

(i) from about 93% to about 99% by weight of at least one resin material selected from the group consisting of hydrocarbon resins prepared from petroleum refined streams, polyterpene resins and esters of rosin having a Ring and Ball softening point of from about 60° C., to about 100° C. in an aqueous dispersion having a solids content from about 53% to about 58%;

(ii) from about 0.5% to about 5%, by weight of the total water content of (i), of at least one water-soluble polymer selected from the group consisting of polyacrylates and cellulose derivatives;

(iii) from about 0.1% to about 2.0% of at least one cationic polyamide-epichlorohydrin resin, by weight of the total solids of (i); and

(iv) optionally, sufficient water so that the solids content of the precoat resin dispersion is from about 63% to about 69%; and

(c) a carboxylated styrene-butadiene latex applied over the precoat resin dispersion.

4,604,312

STRESS-FREE, EMBOSSED, ORNAMENTED TILE SURFACE COVERING AND PROCESS FOR MAKING THE SAME

Thomas C. Creighton, Manheim; William C. Dorsey, Conestoga; Walter J. Lewicki, Jr., Lancaster; Harry F. Long, Lancaster, and Richard M. Ringer, Lancaster, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 434,631, Oct. 15, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 619,318

Int. Cl.[4] B32B *31/00;* **B26D** *5/00;* **B31F** *1/20;* **D04H** *1/00*

U.S. Cl. 428—137 **6 Claims**

1. A process for making a stress-free, dimensionally stable, embossed surface covering comprising:

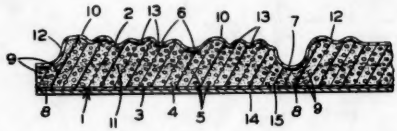
(a) providing a resinous thermoplastic transparent top layer having a plurality of openings extending through the thickness thereof and adapted to allow passage of air therethrough during a subsequent embossing and fusion step, said resinous thermoplastic top layer being a vinyl film having a design on one surface thereof;

(b) providing a low density porous thermoplastic base layer comprising a pre-consolidated resinous dryblend having preformed, hollow, non-thermoplastic particles homogeneously distributed therein;

(c) applying the resinous top layer onto the base layer;

(d) placing an embossing plate with deep recesses adjacent the resinous top layer, wherein the embossing plate is part of a flatbed press having a cooled embossing plate and a cooled backing plate;

(e) embossing the composite structure by pressure which presses the embossing plate into the surface of the com-



posite structure having the resinous top layer by applying high frequency energy to the structure after the press is closed;

(f) permitting air trapped in the deep recesses of the embossing plate to escape through the openings of the top layer into the porous base layer; and

(g) then heating the composite structure under pressure to permit the film to seal shut its perforations and then to fuse the base layer without forcing base layer material into the openings of the top layer.

4,604,313

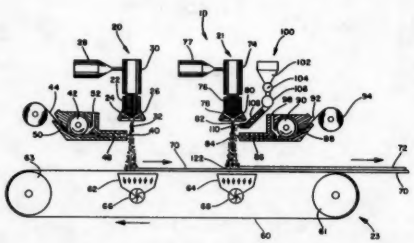
SELECTIVE LAYERING OF SUPERABSORBENTS IN MELTBLOWN SUBSTRATES

Timothy M. McFarland, and Theodore B. Lang, both of Winnebago County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 23, 1984, Ser. No. 602,993

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—172 **14 Claims**



1. A layered nonwoven fabric-like material having a unique combination of strength, absorbency and hand, said material comprising

A. at least one normal absorbent layer of a gas-formed matrix of thermoplastic polymeric meltblown microfibers and a multiplicity of individualized and gas-formed staple fibers disposed throughout said matrix of microfibers and engaging at least some of said microfibers to space the microfibers apart from each other, said staple fibers being interconnected by and held captive within said matrix of microfibers by mechanical entanglement of said microfibers with said staple fibers, the mechanical entanglement and interconnection of said microfibers and staple fibers forming a coherent integrated fibrous structure, and

B. at least one highly-absorbent layer integrally connected to said normal absorbent layer, said highly-absorbent layer

comprising a gas-formed matrix of thermoplastic polymeric meltblown microfibers and a multiplicity of individualized and gas-formed staple fibers and superabsorbent particles disposed throughout said matrix of microfibers and engaging at least some of said microfibers to space the microfibers apart from each other, said staple fibers and said superabsorbent being interconnected by and held captive within said matrix of microfibers by mechanical entanglement of said microfibers with said staple fibers and said superabsorbent particles, the mechanical entanglement and interconnection of said microfibers and staple fibers and said superabsorbent particles forming a coherent integrated fibrous structure.

4,604,314

PRINTED CIRCUIT BOARDS OF LAMINATED THERMOSETTING SHEETS

Wolfgang von Gentzkow, Kleinsendelbach; Maximilian Hödl, Munich; Wolfgang Kleeberg, Erlangen, and Helmut Markert, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 694,776

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402883

Int. Cl.[4] C08K *5/25;* **C08L** *63/00*

U.S. Cl. 428—209 **9 Claims**

1. A laminated thermosetting sheets based printed circuit board wherein the bonding agent of said printed board comprises an epoxy resin containing an amount of N,N'-bis-salicyloyl hydrazine effective to inhibit the formation of conductive anodic filaments in said printed board.

4,604,315

HIGH BULK, BIAXIAL ELASTIC, HEAT SHRUNK FABRIC

Clyde A. McCall, Walhalla, S.C.; Michael J. Campbell, Roswell, and William B. Dean, Cornelia, both of Ga., assignors to Chicopee, New Brunswick, N.J.

Filed Dec. 20, 1983, Ser. No. 563,716

Int. Cl.[4] A61L *15/00;* **D03D** *15/04, 15/08;* **D04B** *11/12*

U.S. Cl. 428—230 **12 Claims**

1. A method of making a heat shrunk, bulk, elastic fabric comprising:

(a) forming an open pattern leno weave of highly heat shrinkable texturized theremoplastic warp direction yarns and "heat set", relatively less heat shrinkable texturized thermoplastic weft direction yarns, and

(b) applying heat to said yarns to bulk and shrink said yarns, to yield a fabric with good elastic recovery in both warp and weft directions, the bulking of the heat-shrunk warp yarns causing said yarns to twist and lie on their sides thereby further twisting the weft yarns and creating a fabric with enhanced elasticity in the weft direction.

7. The fabric produced by the method of claim 1.

4,604,316

FLUOROCHEMICAL COMPOSITION FOR COATING SOIL RESISTANT YARN

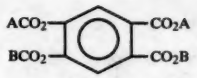
Robert H. Thomas, deceased, late of Lexington County; by Mary A. Thomas, executrix, Columbia, both of S.C.; Willis B. Hammond, Chatham, N.J.; Michael P. Friedberger, and William A. Archie, both of Petersburg, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 350,544, Feb. 19, 1982. This application Sep. 14, 1982, Ser. No. 417,970

Int. Cl.[4] B32B *7/00;* **C07C** *69/76;* **D06M** *13/34*

U.S. Cl. 428—265 **33 Claims**

1. A composition of matter comprising 5 to below 70 percent by weight of fluorocarbon compounds of a mixture of meta and para pyromellitates having the structure

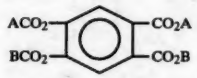


I.

and

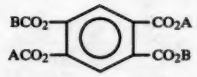
II.

and above 30 to 95 percent by weight of fluorocarbon compounds of a dimer of the same pyromellitates selected from the group consisting of



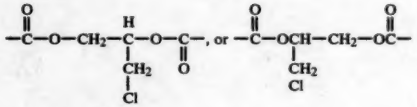
I.

and



II.

and related oligomers,
and mixtures thereof,
wherein Q is



wherein A is $(CH_2)_2(CF_2)_nCF_3$ where n is 5 to 13 and B is $CH_2CHOHCH_2Cl$, and/or

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4,604,317

CURABLE COMPOSITIONS CONTAINING A POLYEPOXIDE AND A HALOGENATED BISPHENOL

Jody R. Berman; Christine C. Berkefelt, and Dale J. Aldrich, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 658,083, Oct. 5, 1984, abandoned. This application May 24, 1985, Ser. No. 737,591

Int. Cl.[4] C08G *59/08*

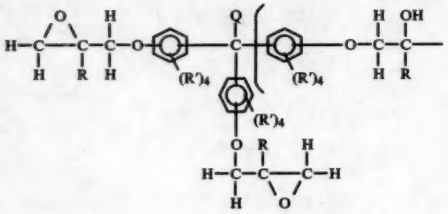
U.S. Cl. 428—285 **48 Claims**

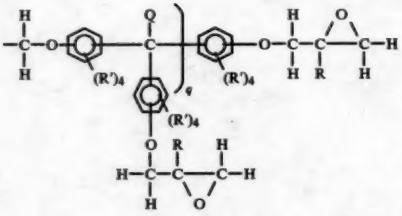
1. A composition comprising

(A) at least one of

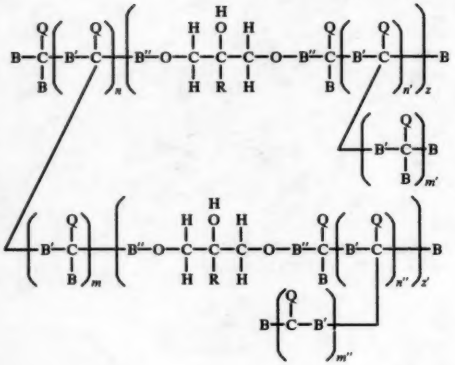
(1) at least one epoxy resin represented by the following formulas I, II, III, IV, V or VI

FORMULA I

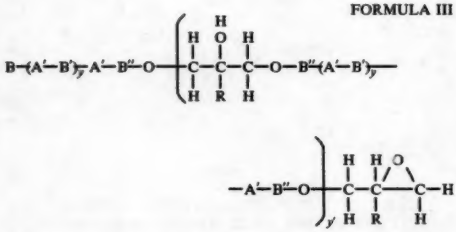




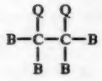
FORMULA II



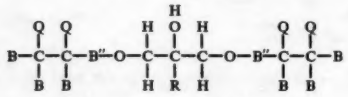
FORMULA III



FORMULA IV



FORMULA V



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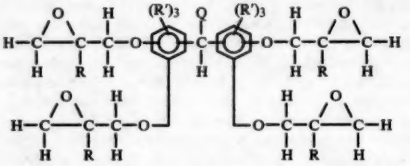
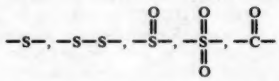
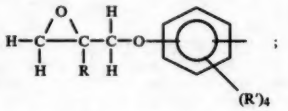
FORMULA VI



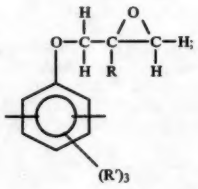
wherein each A and A′ is independently a divalent hydrocarbyl group having from 1 to about 12 carbon atoms,



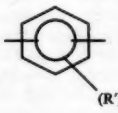
or —O—; each B is represented by the formula



each B′ is represented by the formula



each B″ is represented by the formula

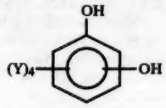


each R is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each Q is independently hydrogen or a hydrocarbyl group having from 1 to about 10 carbon atoms; each R′ is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms or a halogen; m has a value of n − 1; m′ has a value of n′ − 1; m″ has a value of n″ − 1; each n, n′ and n″ independently has a value from zero to about 3; q has a value from zero to about 4; each y independently has an average value from 1 to about 5; y′ has an average value of from zero to about 3 and each z and z′ independently has a value from zero to about 3;

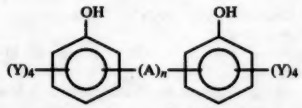
(2) the reaction product of

(a) at least one epoxy resin as defined in component (A-1) and

(b) at least one dihydric phenol represented by the following formulats VII or VIII



FORMULA VII

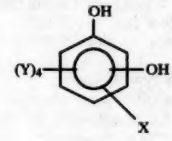


FORMULA VIII

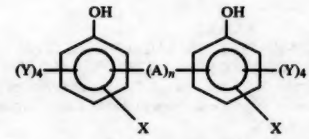
wherein A is as defined above; each y is independently hydrogen, a halogen or a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms; and n has a value of zero or 1; and wherein components (A-2-a) and (A-2-b) are present in quantities such that the ratio of phenolic hydroxyl groups to epoxide groups is from about 0.01:1 to about 0.5:1; or

(3) mixtures thereof;

(b) at least one halogenated dihydric phenol represented by the following formulas IX or X



FORMULA IX



FORMULA X

wherein A, Y and n are as defined above; each X is a halogen; and

wherein components (A) and (b) are present in quantities such that the ratio of phenolic hydroxyl groups to epoxide groups is from about 0.7:1 to about 1.1:1.

4,604,318

COMPOSITION AND PROCESS FOR FORMING INORGANIC RESINS AND RESULTING PRODUCT

William L. Prior, Newark, and William C. Sargeant, Bolivar, both of Ohio, assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 415,314, Sep. 7, 1982, Pat. No. 4,504,555. This application Oct. 1, 1984, Ser. No. 656,686

The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.

Int. Cl.[4] B28B *1/16*; C04B *9/04*

U.S. Cl. 428—289 **58 Claims**

18. A method of manufacturing a resin article comprising:

mixing two components A and B to form a mixture undergoing exothermic reaction;

directing the mixture toward a support surface capable of supporting said mixture until the reaction is completed; wherein component A comprises an aqueous solution of an aluminum phosphate, a magnesium phosphate or mixtures thereof having a viscosity ranging between about 700 and about 10,000 centipoises; and wherein component B comprises an aqueous vehicle; a phosphate-reactive constituent comprising wollastonite, or a source of magnesium oxide or mixtures thereof, and an essentially non-reactive phosphate dispersing agent; said component B having a viscosity permitting it to be rapidly and thoroughly mixed with component A, thereby to form a slurry which reacts exothermically to form an inorganic resin article on said support surface.

19. The method of claim **18** wherein said support surface comprises a fiberglass mat and said mixture impregnates at least an upper surface of said mat to form a fiber-reinforced article.

21. The product made by the process of claim **19.**

4,604,319

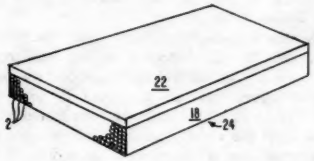
THERMOPLASTIC INTERLEAFED RESIN MATRIX COMPOSITES WITH IMPROVED IMPACT STRENGTH AND TOUGHNESS

Robert E. Evans, Trumbull, Conn., and Kevin R. Hirschbuehler, Bel Air, Md., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 1, 1984, Ser. No. 616,540

Int. Cl.[4] B32B *5/12*

U.S. Cl. 428—290 **20 Claims**



1. An interleafed fiber resin matrix composite which comprises:

(A) a fiber resin matrix layer comprising (i) high-strength reinforcing filaments and (ii) a thermosetting resin composition coating said filaments, and

(B) a discrete interleaf resin layer comprising (i) a thermoplastic resin, adhesively-bondable to said fiber resin matrix layer, wherein said thermosetting resin composition (A)(ii) exhibits shear modulus of at least 90,000 psi at high temperatures or at least 50,000 psi at high temperatures under wet conditions, and said interleaf resin (B) exhibits shear modulus of at least 50,000 psi and a yield strength of at least 3000 psi at high temperatures.

4,604,320

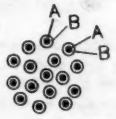
ULTRAFINE SHEATH-CORE COMPOSITE FIBERS AND COMPOSITE SHEETS MADE THEREOF

Miyoshi Okamoto, Takatsuki; Hiromichi Iijima, Otsu, and Akito Miyoshi, Kusatsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 678,386, Dec. 6, 1984, Pat. No. 4,557,972, which is a continuation of Ser. No. 347,623, Feb. 10, 1982, abandoned, which is a continuation-in-part of Ser. No. 338,978, Jan. 12, 1982, abandoned. This application Aug. 23, 1985, Ser. No. 768,730

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—290 **4 Claims**



1. A composite sheet comprising a fabric containing fiber components impregnated with polyurethane, in which all or parts of the fiber components comprise ultrafine composite fibers having a fineness of 0.5 denier or less, wherein said ultrafine composite fibers comprise a sheath component and a core component, the sheath component is mainly composed of a polyester copolymerized with a sulfoisophthalate selected

from the group consisting of 5-sodium sulfoisophthalate, 5-lithium sulfoisophthalate and 5-potassium sulfoisophthalate, and the core component is composed of a polyester selected from the group consisting of polyethylene terephthalate having an IV value of 0.75 to 1.2 and polybutylene terephthalate having an IV value, of 0.85 to 2.5, which core component is free of said sulfoisophthalate or contains sulfoisophthalate at a ratio smaller than in the sheath component.

4,604,321

MERCURY ADSORBING AGENT

Mitsuo Okahara, Kawanishi, and Isao Ikeda, Suita, both of Japan, assignors to Nippon Petrochemicals Co., Ltd., Chiyoda, Japan

Filed Sep. 27, 1984, Ser. No. 655,349
Claims priority, application Japan, Sep. 29, 1983, 58-181481
Int. Cl.[4] B05D *3/02*; C08K *3/04, 3/34, 3/36*
U.S. Cl. 428—319.9 **8 Claims**

1. A mercury adsorbing agent which consists of a porous solid carrier having a specific surface area greater than 10 m^2/g and a conjugated diolefin which contains between 4 and 8 carbon atoms polymer deposited on said solid carrier wherein said solid carrier is a member selected from the group consisting of silica gel, alumina, diatomaceous earth, active carbon, crystalline aluminosilicate and zeolite, said conjugated diolefin polymer has a number average molecular weight of 300–50,000 and said conjugated diolefin polymer is deposited in an amount of 5–50 weight percent upon said carrier.

4,604,322

METALLIZABLE POLYPROPYLENE FILM

Donald E. Reid, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 6, 1985, Ser. No. 762,905
Int. Cl.[4] B32B *27/08, 27/16, 27/18*
U.S. Cl. 428—332 **5 Claims**

1. A metallizable polypropylene film comprising a homopolypropylene core containing about 0.03 to 0.15% by weight based on the polymer of a fatty acid amide slip agent and having on one of its surfaces a 1 to 20 gauge layer comprised of a corona-treated propylene—ethylene copolymer containing about 1 to 10 wt. % ethylene and having no slip agent included therein.

4,604,323

MULTILAYER CATION EXCHANGE MEMBRANE

Bruce B. Johnson, Wallingford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 22, 1985, Ser. No. 704,530
Int. Cl.[4] B32B *27/00*; C25B *1/46, 13/08*
U.S. Cl. 428—336 **2 Claims**

1. A fluorinated cation exchange membrane having at least one fluorine atom on the carbon adjacent to each functional group and having three adhered layers which are, in turn,

(a) a first layer consisting essentially of polymer with sulfonic ion exchange groups,

(b) a second layer adhered to the first layer consisting essentially of polymer with carboxylic ion exchange groups, and

(c) a third layer adhered to the second layer, having a thickness of less than 25 microns and consisting essentially of polymer with carboxylic ion exchange groups having an ion exchange capacity at least 0.1 milliequivalent/gram of dry resin greater than that of the second layer.

4,604,324

MULTI-LAYER POLYPROPYLENE FILM STRUCTURE AND METHOD OF FORMING THE SAME

A. Michael Nahmias, Victor, and Hee C. Park, Fairport, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 28, 1984, Ser. No. 655,614
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—349 **15 Claims**

1. An oriented multi-layer polypropylene film structure comprising coextruded layers of:

(a) a base layer comprising polypropylene of comparatively high stereoregularity; and

(b) a skin layer comprising a polyolefin of comparatively low stereoregularity on at least one surface of (a), said skin layer containing a combination of finely divided silica, a silicon oil and a polymer incompatible with said skin layer polyolefin, said incompatible polymer having a melting point of greater than 150° F. above the melting point of the skin layer polyolefin.

4,604,325

NON-AQUEOUS COATING FOR GLASS FIBERS AND GLASS FIBERS COATED THEREWITH

Jean-Claude Pollet, Granville; Gordon P. Armstrong, Newark, and Martin C. Flautt, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 10, 1985, Ser. No. 732,777
Int. Cl.[4] B32B *17/10*; C08K *5/01*
U.S. Cl. 428—391 **10 Claims**

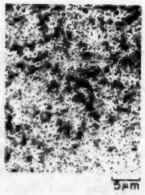
8. A glass fiber including a coating thereon, which coating consists essentially of a cycloaliphatic epoxy resin, an ethylene-ethylacrylate copolymer, a microcrystalline wax, a phenolic-modified terpene resin, and an organosilane.

4,604,326

POROUS REGENERATED CELLULOSE HOLLOW FIBER AND PROCESS FOR PREPARATION THEREOF

Seiichi Manabe, Ibaraki; Michitaka Iwata, Osaka, and Mamoru Inoue, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Apr. 27, 1984, Ser. No. 604,512
Claims priority, application Japan, May 2, 1983, 58-076305; May 2, 1983, 58-076306
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—398 **7 Claims**



1. A porous regenerated cellulose hollow fiber characterized by an inner wall surface, an outer wall surface, a hollow portion extending continuously over the entire fiber length, and a wall thickness portion having pores piercing therethrough between said inner wall surface and outer wall surface , said hollow fiber having about 10^5 to about 10^9 of fine particles and agglomerates thereof per cm^2 of said hollow fiber area wherein said fine particles have a diameter of 0.02 to 1 μm, the cellulose molecules of said fiber having a viscosity average molecular weight of at least 5×10^4, said pores having an average pore diameter D_1 and an in-plane porosity Pr on the inner wall surface of said hollow fiber, an average pore diameter D_2 and an in-plane porosity Pr on the outer wall surface of said hollow fiber and an average pore diameter D_3 and an in-plane porosity Pr of the intermediate part of said wall thickness portion, each

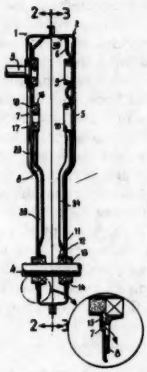
of the average pore diameters D_1 and D_2 being in the range of 0.02 to 10 μm and the in-plane porosity Pr on the outer wall surface of the hollow fiber being at least 10%.

4,604,327

MULTI-LAYER COMPOSITE-WALL PANEL OR CASE STRUCTURE

Gabriel de Smet, Courbevoie, France, assignor to Union Siderurgique du Nord et de l'Est de la France, Puteaux, France

Filed May 18, 1984, Ser. No. 611,814
Claims priority, application France, May 19, 1983, 83 08313
Int. Cl.[4] B32B *3/30*
U.S. Cl. 428—594 14 Claims



1. A composite-wall case structure, comprising two assembled composite wall panels, each comprising at least two shaped walls having regions in which confronting surfaces thereof are in adjoining relation to each other and interconnected by bonding and spot-welding and regions in which hollow bodies are formed between said confronting surfaces for imparting a required rigidity to the panel, one of said walls constituting an outer shell and the other wall a a rolling bearing-carrying wall located inside said case structure, said walls defining apertures for the passage of shafts.

4,604,328

DUCTILE BRAZING ALLOY CONTAINING REACTIVE METALS AND PRECIOUS METALS

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 422,625, Sep. 24, 1982. This application Nov. 16, 1984, Ser. No. 672,057
Int. Cl.[4] C22C *5/02, 5/04, 9/00, 30/00*
U.S. Cl. 428—606 1 Claim

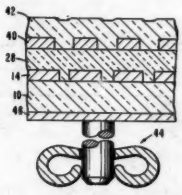
1. An article consisting essentially of a ductile brazing alloy foil having a liquidus temperature of from about 890° C. to about 1400° C., said alloy having a composition consisting essentially of from about 0.25% by weight to about 5% by weight titanium, from about 25% by weight to about 85% by weight of a gold palladium mixture wherein the gold is from about 28% by weight to about 81% by weight and palladium is from about 8% by weight to about 58% by weight of said alloy, from about 3% by weight to about 40% by weight of nickel, from about 20% by weight to about 61% by weight of copper, from 0 to about 40% by weight of molybdenum and from about 0 to about 30% by weight of chromium.

4,604,329

HIGH TECHNOLOGY DECORATIVE MATERIALS AND FABRICATION OF SAME

William L. Reber, 16321 Pacific Coast Hwy., #131, Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 523,683, Aug. 16, 1983, Pat. No. 4,490,440. This application Oct. 5, 1984, Ser. No. 658,409
The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.
Int. Cl.[4] B44D *1/52*
U.S. Cl. 428—620 28 Claims



1. A decorative article of manufacture, comprising:
(a) at least one semiconductor substrate;
(b) a patterned coating formed on a major surface of said substrate, said patterned coating having formed therein a series of lines arranged in a variety of patterns such that incident light will be diffracted in a pleasing pattern, said lines evidencing a ratio of line width to line spacing of about 1:1 to 3:1; and
(c) a transparent layer formed over said at least one patterned coating.

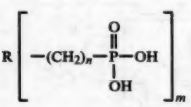
4,604,330

FUEL CELL ELECTROLYTE

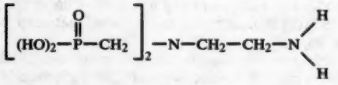
Edward N. Walsh, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 16, 1983, Ser. No. 562,319
Int. Cl.[4] H01M *8/08*
U.S. Cl. 429—13 24 Claims

1. A process for making a fuel cell comprising using one or more phosphonic acids of the formula



wherein m represents an integer from 1 to 3, n represents 0 or the integer 1, and R is a moiety derived from hydroxyalkyl, alkyl, phenyl, alkylphenyl, vinyl, halophenyl, halomethylphenyl, amine, ammonia and



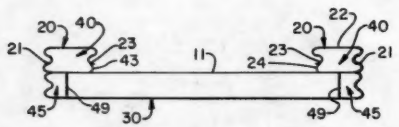
as an electrolyte composition.

4,604,331

FUEL CELL SEPARATOR PLATE WITH BELLOWS-TYPE SEALING FLANGES

George A. Louis, West Hartford, Conn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 29, 1984, Ser. No. 614,505
The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.
Int. Cl.[4] H01M *2/18*
U.S. Cl. 429—35 19 Claims



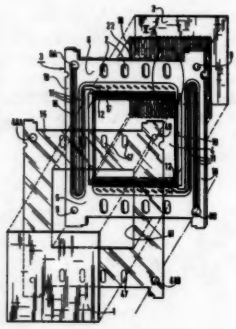
1. A fuel cell separator comprising a substantially flat, planar, gas-impermeable plate, and a sealing flange unitary with said plate and consisting of a peripheral margin of said plate folded back upon itself, said sealing flange including a first portion spaced from said plate and a second portion resiliently compressible in a direction generally normal to the plane of said plate for accommodating variation in the spacing between said first portion and said plate, said second portion of said sealing flange comprises an accordion pleated portion interconnecting said first portion and said plate.

4,604,332

FUEL CELL STRUCTURES

Bernard Warszawski, Paris; Pierre Fauvel, Limours, and Sylvain Dupré , Chilly Mazarin, all of France, assignors to Occidental Chemical Corporation, N.Y.

Filed May 13, 1985, Ser. No. 733,029
Claims priority, application France, May 11, 1984, 84 07313
Int. Cl.[4] H01M *8/24*
U.S. Cl. 429—38 6 Claims



1. In a fuel cell structure constituted by a plurality of cells disposed in electrical contact with one another, each cell comprising:

first and second porous electrodes which are plane in shape with parallel faces, one being a cathode and the other an anode, and each including a specific catalyst;

an electrolyte filling the gap situated between said electrodes; and

two impermeable bipolar current collectors, including at least a central conductive zone having channels on each face of said collectors, a first collector making electrical contact via the high points of its cathode face with the external surface of said cathode, and via its anode face with the external surface of the anode of an adjacent cell, and a second collector making electrical contact via the high points of its anode face with the external surface of said anode, and via its cathode face with the cathode of the other adjacent cell, said first and second electrodes being applied on either side of a frame of insulating plastic material and having a central orifice in the form of a quadrilateral, said electrodes and said frame together defining an electrolyte compartment, orifices within the top and bottom portions of said collectors situated on either side of the central conductive zone being for conveying fuel and electrolyte through the cell structure, one face of said top and bottom portions of said collectors being provided with hollows enabling both the anode face of the collector to be supplied with fuel from the fuel conveying orifices disposed in one of said portions, and the fuel to be evacuated via the fuelconveying orifices disposed in the other portion, the other face of said portions being provided with hollows communicating with the exterior enabling the cathode face of the collector to be supplied with oxidant, such that an oxidizing gas flows between said cathode and the cathode face of the first collector, and a fuel gas flows between said anode and the anode face of the second collector, and means for distributing gas flows disposed in said hollows provided in both faces of the top and bottom portions of the collector,

the improvement wherein said distribution means comprise elongate ribs forming distribution channels, the top face of the ribs lying in the same plane as the face of the portion on which said ribs are provided, said collectors including parallel splines in said central conductive zones defining channels having an average vertical orientation for conveying the gas flows and which are fed from said distributing channels.

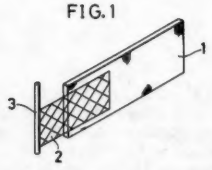
4,604,333

NON-AQUEOUS ELECTROLYTE BATTERY WITH SPIRAL WOUND ELECTRODES

Hironosuke Ikeda, Hirakata; Etsuro Yamashita, Akashi, and Hitoshi Nakashima, Kobe, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Continuation of Ser. No. 596,507, Apr. 3, 1984, abandoned. This application Jul. 1, 1985, Ser. No. 750,855
Claims priority, application Japan, Apr. 6, 1983, 58-51900
Int. Cl.[4] H01M *4/00*
U.S. Cl. 429—94 7 Claims

FIG. 1



1. A non-aqueous electrolyte battery comprising:

a negative electrode of a light metal having an elongated shape elongated in a first direction, said negative electrode having first and second opposed surfaces;

an elongated separator having first and second opposed surfaces, said first separator surface being disposed on one of said electrode surfaces;

a positive electrode of elongated shape having first and second opposed surfaces, one of said positive electrode surfaces being disposed against said separator second surface;

a positive lead extending over at least one of said surfaces of said positive electrode, and being electrically coupled thereto;

a negative lead being disposed over at least one of said negative electrode surfaces and being electrically coupled thereto;

first heat resistant insulating member of a material different from said separator disposed over said negative electrode on said second surface opposite substantially only said negative lead and over substantially only said negative lead; and

second heat resistant insulating member of a material different from said separator disposed substantially only over said positive electrode on said second surface opposite substantially only said positive lead and over said positive lead;

wherein said positive and negative electrodes, separator, leads, and first and second heat insulating members form an electrode body, said electrode body being spirally wound upon itself, such that said negative and positive leads are disposed opposite said positive and negative electrodes respectively.

4,604,334

MO_6SE_6 SOLID STATE ELECTRODE FOR SECONDARY LITHIUM BATTERIES

Jean-Marie Tarascon, Millington, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Oct. 30, 1985, Ser. No. 792,962

Int. Cl.[4] H01M *6/16, 4/36*

U.S. Cl. 429—194 **6 Claims**

1. A non-aqueous battery including a lithium anode, an electrolyte and a cathode, characterized in that said cathode comprises a molybdenum selenide of the formula Mo_6Se_6.

4,604,335

HIGH RATE CATHODE FORMULATION

Dennis P. Johnson, Naperville, Ill., assignor to RAYOVAC Corporation

Filed Mar. 6, 1985, Ser. No. 708,891

Int. Cl.[4] H01M *4/40, 4/48, 4/04*

U.S. Cl. 429—197 **18 Claims**

1. An alkali metal anode, non-aqueous electrolyte cell having a solid cathode, said cathode comprising a major amount of a powdered high energy material, and a minor amount of a material intermixed with minor amounts of powdered zinc and powdered sulfur, the cathode material having been pelletized and heated in a protective atmosphere, which has an improved rate capability as compared to a similar cell having a cathode employing only the same high rate cathode material.

4,604,336

MANGANESE DIOXIDE AND PROCESS FOR THE PRODUCTION THEREOF

John C. Nardi, Brunswick, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

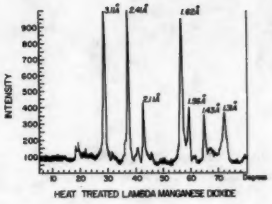
Filed Jun. 29, 1984, Ser. No. 626,104

Int. Cl.[4] H01M *4/50*

U.S. Cl. 429—224 **12 Claims**

1. A galvanic cell comprising an anode, a cathode, and an electrolyte, at least a portion of said cathode comprising manganese dioxide having an X-ray diffraction pattern indicating peaks and relative intensities of peaks as follows:

d(Å)	I/I_O × 100
3.11 ± 0.02	100



-continued

d(Å)	I/I_O × 100
2.41 ± 0.02	80–90
2.11 ± 0.02	28–38
1.62 ± 0.02	65–75
1.56 ± 0.02	18–28
1.43 ± 0.02	20–30
1.31 ± 0.02	25–35

wherein d is the plane spacing corresponding to the particular peak, I is the peak height of the particular peak, and I_O is the peak height of the highest peak.

4,604,337

ELECTROPHOTOGRAPHIC COLOR COPYING PAPER AND COPYING METHOD MAKING USE OF THE SAME

Yoshiyuki Mimura, and Akitoshi Toda, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,785

Claims priority, application Japan, Nov. 28, 1983, 58-222096; Nov. 28, 1983, 58-222097

Int. Cl.[4] G03G *5/12*

U.S. Cl. 430—46 **22 Claims**

1. An electrophotographic copying paper comprising an integrated structure having: a transparent substrate layer; a color filter layer provided on one side of said transparent substrate layer, and a photosensitive layer provided on the other side of said transparent substrate layer, said photosensitive layer including a transparent conductive layer so that said photosensitive layer can function as a photoconductive layer.

4,604,338

POSITIVELY CHARGED COLORED TONER COMPOSITIONS

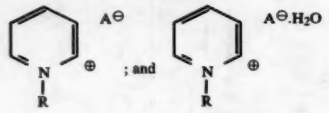
Robert J. Gruber, Pittsford; Raymond A. Yourd, III, Rochester, and Ronald J. Koch, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 9, 1985, Ser. No. 764,024

Int. Cl.[4] G03G *9/08, 9/10*

U.S. Cl. 430—106 **27 Claims**

1. An improved positively charged dry electrostatic colored toner composition consisting essentially of first from about 70% by weight to about 90% by weight of resin particles; from about 10% by weight to about 30% by weight of crosslinked second resin particles; colored pigment particles excluding black; and selected from the group consisting of cyan, magenta, yellow, blue, red, and brown; a low molecular weight wax of a molecular weight of from 500 to about 20,000; and a charge enhancing additive selected from the group consisting of alkyl pyridinium halides, organic sulfonate compositions and organic sulfate compositions of the following formulas:



I.

wherein R is a hydrocarbon group containing from about 8 to about 22 carbon atoms, and A is an anion;

II.

wherein R_1 is an alkyl group of from about 12 carbon atoms to about 22 carbon atoms, R_2 and R_3 are independently selected from alkyl groups containing from about 1 carbon atom to about 5 carbon atoms, R_4 is an alkylene group of from about 1 carbon atom to about 5 carbon atoms, R_5 is a tolyl group or an alkyl group of from about 1 carbon atom to about 3 carbon atoms, and n is the number 3 or 4; and distearyl dimethyl ammonium methyl sulfate, behenyl trimethyl ammonium methyl sulfate, and distearyl methyl ethyl ammonium ethyl sulfate.

4,604,339

METHOD OF DEVELOPING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tadao Sugimoto; Hideo Ikeda; Hiroyuki Mifune, and Koki Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 30, 1983, Ser. No. 556,667

Claims priority, application Japan, Nov. 30, 1982, 57-210498

Int. Cl.[4] G03C *5/54, 5/24*

U.S. Cl. 430—244 **13 Claims**

1. A method of developing, after imagewise exposure, a silver halide photographic light-sensitive material which contains a light-sensitive silver halide emulsion and an internally-fogged silver halide emulsion, comprising: providing as said internally-fogged emulsion an emulsion having internal fogging nuclei inside the grains at a depth of 0.02μ or more below the surface of the grains, and developing said photographic light-sensitive material in the presence of a compound selected from the group consisting of tetraazaindenes containing at least one mercapto group, purines containing at least one mercapto group, triazaindenes containing at least one mercapto group and pentaazaindenes containing at least one mercapto group, thereby obtaining a negative image.

4,604,340

NEGATIVE-TONING IMAGING SYSTEM WITH RE-IMAGING CAPABILITY USING 4-(2'-NITROPHENYL)-1,4-DIHYDROPYRIDINE COMPOUNDS

Mario Grossa, Dreieich, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 22, 1985, Ser. No. 757,841

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429615

Int. Cl.[4] G03C *1/72*

U.S. Cl. 430—270 **8 Claims**

1. Process for the production of patterns on a substrate bearing a layer of a negative-working, light-sensitive composition comprising at least one 1,4-dihydropyridine compound substituted in the 4 position by a 2'-nitrophenyl ring which becomes tacky and tonable on exposure to actinic radiation, comprising the steps of:

(a) exposing said light-sensitive layer imagewise to actinic radiation whereby tacky areas are formed, and,

(b) toning said exposed tacky areas with finely divided powders.

4,604,341

PROCESS FOR THE ONE-STAGE ANODIC OXIDATION OF ALUMINUM BASES FOR OFFSET PRINTING PLATES AND PRODUCT THEREOF

Dieter Mohr, Schlangenbad, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,588

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3328049

Int. Cl.[4] C25D *11/06;* **B41N** *1/04;* **B41C** *1/10*

U.S. Cl. 430—278 **13 Claims**

1. A process for producing a base for an offset printing plate comprising the steps of:

subjecting a base material selected from aluminum and aluminum alloys to an electrochemical roughening treatment in an acid to produce a roughened base material, and

anodically oxidizing said roughened base material in a single stage in an aqueous H_3PO_4-free electrolyte comprising dissolved inorganic phosphoroxo-anions of inorganic phosphoroxo compounds selected from the group consisting of metaphosphoric, pyrophosphoric or polyphosphoric acids or alkali metal or alpaline earth metal or ammonium salts of orthophosphoric, metaphosphoric, pyrophosphoric or polyphosphoric acids for a period from about 1 to about 90 seconds, at a voltage from 20 to about 100 volts and at a temperature from about 10° to about 80° C. to produce a metal oxide layer having a weight per unit of at least 0.5 g/m^2.

4,604,342

PHOTOPOLYMERIZABLE MIXTURE AND RECORDING MATERIAL PRODUCED FROM IT

Manfred A. J. Sondergeld, Muhlheim, and Mario Grossa, Dreieich, both of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 13, 1985, Ser. No. 711,251

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409821

Int. Cl.[4] G03C *1/68, 1/70*

U.S. Cl. 430—281 **11 Claims**

1. A photopolymerizable mixture comprising a water-insoluble, binding agent which is soluble or at least capable of swelling in aqueous-alkaline solutions, a photoinitiator or a photoinitiator system, one or several photopolymerizable ethylenically unsaturated monomers, characterized in that at least one of the photopolymerizable ethylenically unsaturated monomers contains at least one aromatic hydroxyl-, aromatic mercapto-, aromatic sulfonamide-or aromatic mono-N-substituted sulfonamide group, or combinations thereof.

6. Light-sensitive recording material comprising a support, at least one photopolymerizable layer, characterized in that the photopolymerizable layer comprises the photopolymerizable mixture according to claim 1.

4,604,343

WATER DEVELOPABLE PHOTOSENSITIVE RESINOUS COMPOSITION

Kiyomi Sakurai, Neyagawa, and Katsuzi Konishi, Izumisano, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

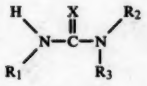
Continuation of Ser. No. 582,791, Feb. 23, 1984, abandoned. This application Jun. 13, 1985, Ser. No. 744,293

Int. Cl.[4] G03C *1/68*

U.S. Cl. 430—281 **6 Claims**

1. In a water developable photosensitive composition consisting essentially of a water soluble polymer selected from the

group consisting of polyvinyl alcohol, partially saponified polyvinyl acetate, methyl cellulose, ethyl cellulose, hydroxypropyl propyl cellulose, hydroxy propylmethyl cellulose, polyethylene oxide, polyacrylamide, maleic acid copolymer and a nylon resin having water soluble groups, photopolymerizable unsaturated monomer(s), and a photopolymerization initiator, the improvement wherein at least 30% of said photopolymerizable unsaturated monomer(s) is a product made by reacting 1 mole of urea, thiourea or an alkyl derivative thereof of the formula:



wherein R_1, R_2 and R_3 are the same or different, and each represents hydrogen or a lower alkyl group and X represent oxygen or a sulfur atom, and 0.75 to 1.3 moles of an N-alkylol acrylamide or an N-alkylol methacrylamide, said photosensitive resin composition being present such that for 100 parts by weight of the water soluble polymer compound, 10 to 250 parts by weight of the photopolymerizable unsaturated monomer(s) and 0.01 to 30 parts by weight of the photopolymerization initiator are present in the composition.

4,604,344

PROCESS FOR THE PRODUCTION OF IMAGES USING SEQUENTIALLY LIQUID POLYMERIZING COMPOSITIONS AND PHOTOCURING

Edward Irving, Burwell, and Terence J. Smith, Royston, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 23, 1985, Ser. No. 694,178

Claims priority, application United Kingdom, Feb. 3, 1984, 8402937

Int. Cl.⁴ G03C *7/26, 5/16*

U.S. Cl. 430—325 **20 Claims**

1. A process for the production of an image which comprises
(a) applying to a substrate a polymerizing agent,
(b) applying to the polymerizing agent on the substrate a layer of a liquid composition containing a residue that is polymerizable on contact with the polymerizing agent, and a photocurable residue, such that the layer solidifies but remains photocurable,
(c) exposing the solidified layer to actinic radiation in a predetermined pattern such that exposed parts of the layer are photocured, and
(d) removing those parts of the layer which have not become substantially photocured by treatment with a solvent therefor.

4,604,345

EXPOSURE METHOD

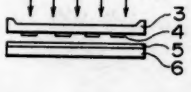
Mitsuaki Amemiya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 729,051

Claims priority, application Japan, May 11, 1984, 59-92893

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—394 **11 Claims**



1. A method of transferring a pattern of a first object onto a radiation-sensitive layer of a second object by exposing the radiation-sensitive layer to radiation, said method comprising:
a primary exposure step for exposing, with a higher resolution, the radiation-sensitive layer to radiation through the pattern of the first object; and
a secondary exposure step for exposing the radiation-sensitive layer to radiation by an amount which does not have a substantial effect on the radiation-sensitive layer;
wherein the primary step and the secondary step, when combined, are effective to transfer the pattern of the first object onto the radiation-sensitive layer of the second object.

4,604,346

SKIN-EQUIVALENT PREPARED BY THE USE OF PUNCH BIOPSY

Eugene Bell, Dedham, Mass., and Louis Dubertret, Paris, France, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 9, 1984, Ser. No. 658,499

Int. Cl.⁴ A01N *1/02*

U.S. Cl. 435—1 **10 Claims**

1. A method of forming a skin-equivalent, comprising:
a. forming an acidic solution of collagen;
b. combining contractile cells and nutrient medium with said acidic solution of collagen;
c. raising the pH of said solution of collagen to a level sufficient to precipitate collagen fibrils into a hydrated collagen lattice containing said contractile cells;
d. incorporating one or more punch biopsies of skin into said hydrated collagen lattice; and
e. maintaining said hydrated collagen lattice containing said punch biopsies under conditions sufficient for the contractile cells to contract the hydrated collagen lattice into a dermal-equivalent and sufficient to allow keratinocyte cells from said punch biopsies to overgrow the surface of said dermal equivalent thereby producing a skin-equivalent.

4,604,347

ANALYTICAL ELEMENT FOR DRY ANALYSIS

Fuminori Arai; Mitsutoshi Tanaka, and Harumi Katsuyama, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 6, 1984, Ser. No. 577,090

Claims priority, application Japan, Feb. 7, 1983, 58-17542

Int. Cl.⁴ C12Q *1/00;* **G01N** *33/52*

U.S. Cl. 435—4 **10 Claims**

1. An analytical element for dry analysis of analyte in a liquid sample which contains a liquid-impermeable, light-transmissive support, a non-diffusive acid-containing layer, and a non-diffusive base-containing layer, the latter two layers being arranged on the support such that both layers upon liquid contact adjust the surrounding pH of a predetermined reaction area and wherein at least one of the latter two layers contains a reagent which participates in the analytical reaction which takes place.

4,604,348

COMPOSITION FOR USE IN IMMUNOASSAYS

A. Robert Neurath, New York, N.Y., assignor to New York Blood Center, Inc., New York, N.Y.

Division of Ser. No. 323,003, Nov. 19, 1981, Pat. No. 4,459,359.

This application Jan. 20, 1984, Ser. No. 572,494

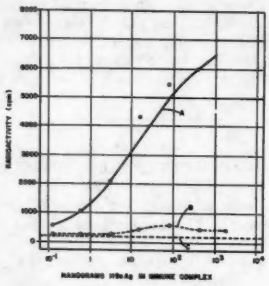
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.⁴ G01N *53/00, 33/564*

U.S. Cl. 435—7 **13 Claims**

1. A kit for determining the presence of an antigen or antibody in a sample wherein said antigen or antibody exists in the form of an immune complex, said kit comprises
(a) a solid support which binds proteins,
(b) a container containing a dissociating buffer,
(c) a container containing a protein capable of filling-in unoccupied sites on the solid support, and

(d) a container containing a radiolabelled or enzyme labelled antibody or antigen,



said support, buffer, protein and radiolabelled or enzyme labelled antibody or antigen present in amounts sufficient to perform an assay for an antigen or antibody.

4,604,349

PROCESS FOR PREPARING URIDINE DIPHOSPHATE-N-ACETYLGALACTOSAMINE

Taiko Seno, Osaka; Yasuto Okubo, Nara; Masao Kawamura, Akashi; Seiichi Akutsu, Kakogawa, and Hirosuke Fukuda, Himeji, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Miyanishi, Japan

Division of Ser. No. 499,919, Jun. 1, 1983, Pat. No. 4,569,909. This application Feb. 25, 1985, Ser. No. 705,217

Claims priority, application Japan, Jun. 3, 1982, 57-95984; Jun. 3, 1982, 57-95986; Jun. 3, 1982, 57-95987; Jun. 3, 1982, 57-95988

Int. Cl.[4] C12Q *1/60*

U.S. Cl. 435—15 **2 Claims**

1. In the method of measuring the activity of α-N-acetylgalactosaminyl transferase wherein Type O red blood cells are converted to Type A red blood cells in the presence of a N-acetylgalactosamine donor and the activity of A-transferase is determined on the basis of their strength of agglutination with anti A serum, the improvement wherein the N-acetylgalactosamine donor which is the substrate for the conversion is a reaction mixture obtained by the conversion of uridine diphosphate-N-acetylglucosamine to uridine diphosphate-N-acetylgalactosamine in the presence of uridine diphosphate-N-acetylglucosamine-4-epimerase obtained by partially purifying cell free extracts of *Bacillus bacterium* by fractionation with ammonium sulfate, the reaction mixture being composed mainly of the uridine diphosphate-N-acetylgalactosamine and unreacted uridine diphosphate-N-acetylglucosamine.

4,604,350

SCREENING TEST FOR BETA-THALASSEMIA TRAIT AND A DIAGNOSTIC KIT FOR ITS INDIVIDUALIZATION

Maria C. De Matteis, Piazza Isotta Nogarola, 15 - 37131 Verona, Italy

Filed Apr. 15, 1983, Ser. No. 485,327

Claims priority, application Italy, Apr. 29, 1982, 41564 A/82

Int. Cl.[4] C12Q *1/06*; G01N *33/72*

U.S. Cl. 435—29 **3 Claims**

1. A method for detecting quantitatively beta-thalassemia in a patient which consists of:

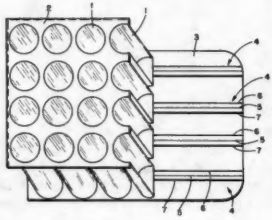
(a) preparing an aqueous solution A containing 148.5 mmoles of glycerol, 58 mmoles of sodium chloride, 7 mmoles of sodium dihydrogen phosphate, 3 mmoles of disodium monohydrogen phoshate, 1 mmole of sodium azide, 0.04 mmoles of Acid Green 5 ($C_{37}H_{34}N_2Na_2O_3S_9$) of pH 6.5 per liter of solution;

(b) placing 3 cc of said solution A from step (a) in a test tube;

(c) adding to said solution A 5 microliters of capillary freshly drawn blood or venous blood collected in the presence of an anticoagulant, stirring therewith to obtain a suspension and incubating said suspension for 30–45 minutes at room temperature to obtain the test suspension;

(d) preparing solution B from 150 mmoles of sodium chloride and 0.04 mmoles of Acid Green 5, said solution B being the 100% turbidity solution;

(e) placing 3 ml of said solution B from step (d) in a second test tube;



(f) preparing a blood suspension having 100% turbidity by shaking said solution B with 5 microliters of the blood from the same patient to obtain the comparison suspension;

(g) separately measuring at 495 nm wavelength the optical densities of said carefully stirred blood suspensions from steps (c) and (f) against said solution A from step (a) without blood added, and using said solution A as a blank;

(h) comparing the degree of turbidity based on values calculated as percent turbidity according to the equation

$$\frac{O.D.\text{ test suspension from step }(c)}{O.D.\text{ comparison suspension from step }(f)} \times 100. = \%\text{ turbidity}$$

and when the turbidity value is lower than 30%, said patient is normal, when the turbidity is between 30 and 50%, said patient is suspect and when the turbidity value is greater than 50%, said patient is a carrier of beta-thalassemia trait.

4,604,351

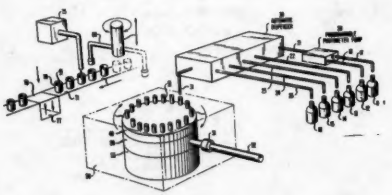
METHOD FOR DETERMINING BACTERIAL SENSITIVITY TO CHEMICAL AGENTS

Leonard Amaral, Pound Ridge, N.Y., assignor to Bronx Lebanon Hospital, Bronx, N.Y.

Division of Ser. No. 554,159, Nov. 22, 1983, abandoned, which is a division of Ser. No. 300,943, Sep. 10, 1981, Pat. No. 4,416,995. This application Jul. 13, 1984, Ser. No. 630,736

Int. Cl.[4] C12Q *1/16, 1/02, 1/18*

U.S. Cl. 435—35 **20 Claims**



1. A method for ascertaining the effect of a chemical on bacteria comprising the steps of:

(1) dividing a specimen of bacteria into a test sample and a control sample;

(2) culturing said test sample in the presence of a chemical for a first period of time;
(3) culturing said control sample in the absence of said chemical for the same first period of time;
(4) adding a radioactively-labelled nucleotide, wherein said nucleotide is selected from the group consisting of thymidine and thymidine analogs, to said test and control samples at a predetermined period of time after the beginning of, but before the expiration of said first period of time;
(5) determining the uptake of radioactively-labelled nucleotide by said test and control samples; and
(6) comparing the respective uptakes of radioactively-labelled nucleotide by said control and test samples.

4,604,352

CO-CULTURE PRODUCTION OF THERMOSTABLE ENZYMERS AND ETHANOL

Joseph G. Zeikus, Okemos, Mich., and Hyung-Hwan Hyun, Madison, Wis., assignors to Michigan Biotechnology Institute, East Lansing, Mich.

Filed Sep. 18, 1984, Ser. No. 652,588
Int. Cl.[4] C12D *39/00, 7/14;* C12N *9/34, 9/44*
U.S. Cl. 435—42 **4 Claims**

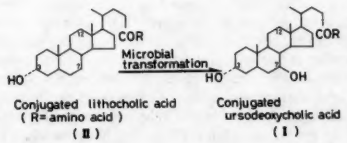
1. A method for the co-production of a thermostable β-amylase, a thermostable glucoamylase, a thermostable pullulanase and ethanol which comprises growing a biologically pure co-culture of *Clostridium thermosulfurogenes* and *Clostridium thermohydrosulfuricum* under anaerobic conditions on a carbohydrate substrate in a medium comprising essential vitamins, minerals and growth factors for a time sufficient to produce recoverable amounts of said themostable enzymes and ethanol.

4,604,353

METHOD FOR PRODUCING CONJUGATED URSODEOXYCHOLIC ACIDS BY MEANS OF MICROBIAL TRANSFORMATION

Haruji Sawada, and Masaaki Watanuki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,426
Claims priority, application Japan, Mar. 4, 1983, 58-035554
Int. Cl.[4] C12P *33/06;* C12R *1/645*
U.S. Cl. 435—58 **5 Claims**



1. A method for producing a ursodeoxycholic acid conjugated with an amino acid from a lithocholic acid conjugated with said amino acid by means of microbial transformation, comprising the steps of:
cultivating a microorganism which belongs to *Mortierella ramanniana* and which has capability to produce said ursodeoxycholic acid conjugated with said amino acid from said lithocholic acid conjugated with said amino acid,
bringing said lithocholic acid conjugated with said amino acid into contact with said microorganism to convert said lithocholic acid conjugated with said amino acid to said ursodeoxycholic acid conjugated with said amino acid, and
recovering said ursodeoxycholic acid conjugated with said amino acid thus produced.

4,604,354

IMMOBILIZED GLUCOSE ISOMERASE CONTAINING MICROBIAL CELLS

Edward Katz, St. Louis; Jon J. Benedicktus, Oakland; Edward L. Knarr, St. Louis, and Barrett L. Scallet, Clayton, all of Mo., assignors to Busch Industrial Products Corporation, St. Louis, Mo.

Continuation of Ser. No. 400,890, Jul. 22, 1982, abandoned. This application Apr. 17, 1985, Ser. No. 724,074
Int. Cl.[4] C12P *19/24;* C12N *11/00, 11/14, 11/02*
U.S. Cl. 435—94 **10 Claims**

1. A method of immobilizing glucose isomerase cell material obtained from whole microbial cells of an organism of the genus Actinoplanes containing glucose isomerase comprising the steps of:
a. preparing whole microbial cells of an organism of the genus Actinoplanes containing glucose isomerase,
b. disrupting a substantial portion of said whole cells,
c. adding a flocculant to said disrupted glucose isomerase cell material,
d. recovering and dewatering the flocculated cell material,
e. adding to said dewatered flocculated glucose isomerase cell material from about 3% to about 15% of a water absorbing smectite filler and about 5% to about 55% granular activated carbon of about 50 to about 100 mesh, both by weight of total composite mixture on a dry solids basis, and
f. forming the mixture of glucose isomerase cell material and the water absorbing smectite filler and granular activated carbon into discrete particles.

4,604,355

MALTOGENIC AMYLASE ENZYME, PREPARATION AND USE THEREOF

Helle Outtrup, Syvendehusvej, Denmark, assignor to Novo Industri A/S, Denmark

Filed Mar. 20, 1984, Ser. No. 591,460
Claims priority, application Denmark, Mar. 25, 1983, 1359/83
Int. Cl.[4] C12P *19/22, 19/16;* C12N *9/26;* C12R *1/07*
U.S. Cl. 435—95 **5 Claims**

1. A maltogenic amylase enzyme obtained by cultivation in a suitable nutrient medium of Bacillus strain NCIB 11837.

4,604,356

PURIFICATION OF FLAVIN ADENINE DINUCLEOTIDE SYNTHETASE

Robert C. Blake, II, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 21, 1983, Ser. No. 563,973
Int. Cl.[4] C12N *9/12;* C12Q *1/48*
U.S. Cl. 435—194 **17 Claims**

1. A method for purifying flavin adenine dinucleotide synthetase comprising the steps of:
(a) disrupting cells containing flavin adenine dinucleotide synthetase activity,
(b) separating a liquid fraction,
(c) treating the separated liquid fraction with a protein precipitating agent,
(d) separating the precipitated protein,
(e) applying a solution of the precipitated protein to a chromatography column containing a moiety selective for flavin adenine dinucleotide synthetase,
(f) eluting the chromatography column with a first eluting solution containing one of (1) flavin mononucleotide or an effective analogue thereof or (2) adenosine triphosphate or an effective analogue thereof and a divalent cation, as a first eluent, and collecting a fraction containing flavin adenine dinucleotide synthetase activity,
(g) applying the collected fraction to a chromatography column containing a molecular sieve capable of excluding molecules greater than at least about 10^5 daltons, eluting

and collecting a fraction containing flavin adenine dinucleotide synthetase activity,

(h) applying the collected fraction to a second chromatography column containing a moiety selective for flavin adenine dinucleotide synthetase,

(i) eluting the second chromatography column with a second eluting solution containing the other of (1) flavin mononucleotide or an effective analogue thereof or (2) adenosine triphosphate or an effective analogue thereof and a divalent cation, not present in said first eluting solution, as a second eluent, and collecting a fraction containing flavin adenine dinucleotide cleotide synthetase activity, and

(j) removing said second eluent from the collected fraction.

4,604,357

ANTIMICROBIAL DISINFECTING URINAL BLOCK MEANS AND METHODS OF USE

Denis M. Callewaert, Oxford, and Earl J. Braxton, Utica, both of Mich., assignors to Enzymes of America, Utica, Mich.

Filed Apr. 13, 1984, Ser. No. 600,141
Int. Cl.[4] C12N *9/72*
U.S. Cl. 435—215 **8 Claims**

1. A method of minimizing urine protein degradation occurring during the collection of pooled urine employing as urinal block means

a hydrophilic water-leachable antimicrobial agent adapted in operation to be leached ratably by exposure to intermittent urine streams that is distributed in a matrix of water-insoluble hydrophobic component adapted in operation to sublime ratably to the air, the antimicrobial agent being partly leachable when exposed to urine streams and partly leachable only when and as the matrix sublimes away from the block, the respective rates of leaching and subliming during the service life being chosen such that the antimicrobial agent progressively exposed by said subliming and leaching of the thus exposed antimicrobial agent from the block means into the pooled urine is sufficient to provide an inhibitor concentration effectively inhibiting microbial growth and consequent degradation of wanted proteins contained in the pool,

the method comprising the steps of installing the block means in a urinal at a location such that the block means is exposed to air and intermittent urine streams but is not exposed to flushing water, allowing the matrix to sublime and progressively expose the water-leachable antimicrobial agent while further allowing said agent to be protected from exposure to flushing water and to be exposed to urine streams and released to the pool in a discontinuous slow release coinciding with the intermittent streams, and collecting urine to which the block means is exposed in a common pool together with an antimicrobial agent that is leached from the block means for a time not longer than the expiration of the useful life of the antimicrobial agent.

4,604,358

PREPARATION OF PASTEURIZED HUMAN PLASMINOGEN

Joseph D. Fisher, Chicago Heights, and Chin C. Huang, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 484,837, Apr. 14, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 722,099
Int. Cl.[4] C12N *9/68, 9/96*
U.S. Cl. 435—217 **7 Claims**

1. A method for pasteurizing plasminogen comprising the steps of:

treating an aqueous solution of unpasteurized plasminogen by adding to said solution a protecting agent selected from the group consisting of methyl lysine ester, ethyl lysine ester or a hydrochloride salt thereof to thereby attach said agent to plasminogen and form modified plasminogen; and subjecting the resulting modified plasminogen to a heat treatment of at least 60° C. for at least 10 hours.

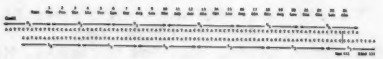
4,604,359

MICROBIAL EXPRESSION OF GENE FOR HUMAN GROWTH HORMONE

David V. Goeddel, and Herbert L. Heyneker, both of Burlingame, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 55,126, Jul. 5, 1979, Pat. No. 4,342,832. This application Mar. 9, 1982, Ser. No. 361,160
Int. Cl.[3] C12N *1/20, 15/00*
U.S. Cl. 435—253 **2 Claims**

HGH (1-24)



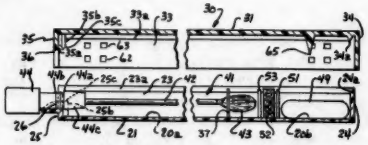
1. A viable culture of bacterial transformants comprising plasmids capable, in a transformant bacterium, of expressing a gene for human growth hormone unaccompanied by extraneous protein bound thereto.

4,604,360

CULTURE TRANSPORT APPARATUS

Melvin W. Hounsell, 1609 Sun Valley Dr., Beloit, Wis. 53511

Filed Jan. 19, 1983, Ser. No. 459,049
Int. Cl.[4] C12M *1/00, 1/28, 1/30*; B01J *7/00*
U.S. Cl. 435—287 **27 Claims**



1. A culture transport apparatus comprising, an open top receptacle having a bottom wall and upstanding side wall means, a cover having a top wall and depending cover flange means adapted to extend downwardly along the side wall means of the receptacle, a culture receiving device having a plug member at one end, the side wall means of the receptacle having a recess therein, the receptacle having a first open top culture device receiving area at one area of the bottom wall contiguous to said recess in the side wall means for receiving the culture receiving device when the plug member is positioned in said recess in the side wall means, the receptacle having a second open top container retaining area at a second area of the bottom wall and communicating with the first culture device receiving area, a rupturable container in said second container retaining area containing a material for use in maintaining viability of a microbial sample, interengaging detent means on the receptacle side wall means and cover flange means for releasably retaining the cover in a first position on the receptacle with the top wall of the cover spaced above the bottom wall of the receptacle to maintain the culture receiving device and rupturable container in the respective first culture device receiving area and second container retaining area without rupturing the rupturable container, the interengaging detent means being releasable in response to downward pressure on the cover to allow the cover to move down to a second position, means operative when the cover is moved from its first to its second position on the receptacle for rupturing the rupturable container to release the material therein, the

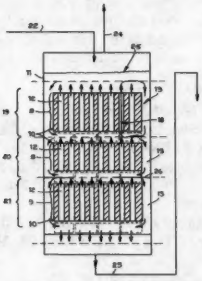
cover flange means having a recess therein at a location to form an opening with the recess in the side wall means of the receptacle when the cover is on the receptacle, and means on the cover and receptacle for sealing the first culture device receiving area and second container retaining area in the receptacle from outside atmosphere when the cover is in said second position.

4,604,361

REACTOR FOR PRODUCING GAS BY MEANS OF MICRO-ORGANISMS

Roeland H. Peters, Standbridge East, Canada, assignor to Agropur Cooperative Agro-Alimentaire, Granby, Canada

Filed Mar. 29, 1983, Ser. No. 480,104
Int. Cl.[4] C12M *1/40, 1/02;* B01J *1/00*
U.S. Cl. 435—288 **16 Claims**



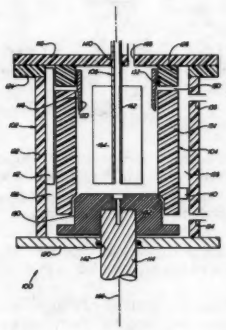
1. A column reactor for continuous production of a gaseous reaction product by contacting a downwardly flowing liquid reaction medium with a gas-forming agent fixed to a solid substrate, said reactor comprising an outer shell wall, inlet means for feeding liquid reaction medium into the reactor, outlet means for recovering gaseous reaction product, outlet means for recovering treated liquid reaction medium, and at least two reaction zones disposed within said outer shell wall following one after the other; wherein each reaction zone includes a first upstream free volume, a reaction plug consisting of a solid substrate provided with a plurality of gas-forming channels and having a periphery adjacent the outer shell wall, and a second downstream free volume spaced apart from said first free volume by said reaction plug; said gas-forming channels communicating between the first free volume and the second free volume and having a gas-forming agent fixed to the walls thereof; each reaction zone further being provided with a circulatory by-pass means communicating between said first and second free volumes for allowing liquid reaction medium to by-pass said channels; said channels and said by-pass means together facilitating an internal circulation of liquid reaction medium rising through the gas-forming channels into said first free volume under the influence of gaseous reaction product and passing from said first free volume through said by-pass means and the second free volume back to said gas-forming channels, and wherein the first free volume of each following reaction zone is in fluid communication with the second free volume of the preceding reaction zone.

4,604,362

GAS-LIQUID REACTOR AND A METHOD FOR REACTING LIQUIDS AND GASES

Jin Y. Park, Moscow; Barry H. O'Brien, Idaho Falls, and Woo G. Lee, Moscow, all of Id., assignors to Research Corporation, New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,246
Int. Cl.[4] G01N *33/50*
U.S. Cl. 436—34 **26 Claims**



1. A method comprising reacting liquids and gases over a substantially constant size surface area, by

directing a liquid into a rotatable reaction vessel;

rotating the reaction vessel to force liquid therein against an inside surface of the reaction vessel and into a thin liquid film having a stable shape and a smooth, substantially constant size surface area;

directing a gas into the reaction vessel to react with the liquid film over the substantially constant size surface area to facilitate analyzing the gas-liquid and reactions;

discharging gas and liquid from the reaction vessel; and

analyzing the chemical compositions of the gas and liquid discharged from the reaction vessel.

4. A gas-liquid reactor comprising: means for reacting gases and liquids over a substantially constant size surface area, including,

an outside containment vessel having a liquid inlet and a liquid outlet;

an inside reaction vessel supported within the containment vessel for rotation about an axis, and having a liquid inlet and a liquid outlet, the outside containment vessel and the inside reaction vessel forming a liquid passage for conducting liquid from the liquid inlet of the outside containment vessel to the liquid inlet of the inside reaction vessel;

drive means connected to the inside reaction vessel to rotate the inside reaction vessel, and to subject liquid therein to a centrifugal force field and force the liquid outward against an inside surface of the inside reaction vessel and into a thin liquid film having a substantially constant size surface area;

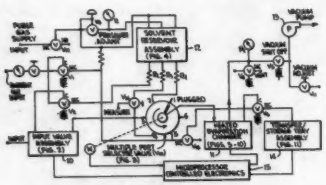
gas conduit means extending through the outside containment vessel and into the inside reaction vessel to conduct gas thereinto to react the gas with the liquid over the substantially constant size surface area to facilitate analyzing the gas-liquid reactions; and

means for receiving and analyzing the chemical compositions of the gas and liquid discharged from the inside reaction vessel.

4,604,363
AUTOMATIC EVAPORATOR SYSTEM

Daniel L. Newhouse, Harrisburg; Richard G. Wheeler, and Ralph H. Waltz, both of Columbia, all of Mo., assignors to Analytical Bio-Chemistry Laboratories Inc., Columbia, Mo.

Filed Oct. 18, 1984, Ser. No. 662,061
Int. Cl.[4] G01N *1/18, 21/00, 31/00, 33/00*
U.S. Cl. 436—177 **42 Claims**



1. A system comprising: means for automatically evaporating a predetermined volume of liquid from a sample solution having a known vapor pressure versus temperature characteristic curve, said system solutions, including,

an enclosure means;

supply means for delivering at least part of said predetermined volume of sample solution to said enclosure means; and

control means for evaporating said supply solution from said enclosure means at a predetermined rate by automatically controlling temperature in said enclosure means to maintain the pressure and temperature in said enclosure means substantially on said known vapor pressure versus temperature characteristic curve.

39. A method comprising: automatically evaporating a predetermined volume of liquid from a sample solution having a known vapor pressure versus temperature characteristic curve, by,

delivery at least part of a predetermined volume of said sample solution to an evaporation chamber; and

evaporating said sample solution from said evaporation chamber at a predetermined rate by controlling the temperature and pressure in said chamber to maintain the pressure and temperature of the liquid in said chamber substantially on said known vapor pressure versus temperature characteristic curve.

4,604,364
BIOLUMINESCENT TRACER COMPOSITION AND METHOD OF USE IN IMMUNOASSAYS

Kenneth M. Kosak, 3194 S. 4400 West, Salt Lake City, Utah 84120

Continuation-in-part of Ser. No. 106,354, Dec. 21, 1979, which is a continuation-in-part of Ser. No. 430,921, Jan. 4, 1974, Pat. No. 4,000,252. This application Apr. 21, 1983, Ser. No. 487,267
Int. Cl.[4] G01N *21/76, 33/532, 33/533, 33/536*
U.S. Cl. 436—501 **25 Claims**

1. A tracer composition comprising a material to be labelled selected from the group consisting of ligands and ligators, covalently coupled to luciferase through functional groups that are capable of coupling with glutaraldehyde, such functional groups being selected from amine, amide, phenolic hydroxyl, carbonyl and sulfhydryl groups.

13. A tracer composition comprising a material to be labelled selected from the group consisting of ligands and ligators, covalently coupled to a bioluminescent photon emitter selected from the group consisting of photoproteins, aequorin, mnemiopsin, berovin, scintillons and lumisomes.

17. In a nonradioactive immunoassay method for determining the presence of ligands and ligators in a competitive assay comprising

(1) bringing together under conditions conducive to binding;

(a) said ligand to be measured, with;

(b) a ligator which has selective affinity for (a) and where the concentration of (b) is not sufficient to bind all of (a), with;

(c) a labelled ligand which has selective affinity for (b) and competes with (a) for binding to (b);

(2) and selectively determining the amount of unbound (c) and of (c) bound to (b);

the improvement wherein said labelled ligand is a bioluminescent tracer composition comprising a material selected from the group consisting of ligands and ligators covalently coupled to luciferase and wherein step 2 includes the use of a bioluminescent reaction for detection.

20. In a nonradioactive assay method for determining the presence of ligands and ligators in a competitive binding assay comprising,

(1) bringing together under conditions conducive to binding;

(a) said ligand to be measured with;

(b) a ligator which has selective affinity for (a) and where the concentration of (b) is not sufficient to bind all of (a), with;

(c) a labelled ligand which has selective affinity for (b) and competes for binding to (b);

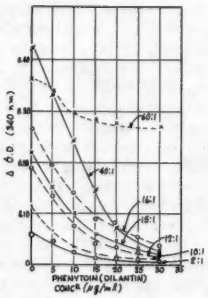
(2) and selectively determining the amount of unbound (c) and of (c) bound to (b);

the improvement wherein said labelled ligand is a bioluminescent tracer composition comprising a material selected from the group consisting of ligands and ligators covalently coupled to a bioluminescent photon emitter selected from the group consisting of photoproteins, aequorin, mnemiopsin, berovin, scintillons and lumisomes and wherein step 2 includes the use of a bioluminescent reaction for detection.

4,604,365
IMMUNOPRECIPITATION ASSAY

Sean P. O'Neill, Bethesda, and Joseph Wu, Gaithersburg, both of Md., assignors to Electro-Nucleonics, Inc., Fairfield, N.J.

PCT No. PCT/US82/00737, § 371 Date Jul. 1, 1982, § 102(e) Date Jul. 1, 1982, PCT Pub. No. WO82/04323, PCT Pub. Date Dec. 9, 1982
Continuation-in-part of Ser. No. 269,727, Jun. 2, 1981, abandoned. This PCT application May 28, 1982, Ser. No. 406,762
Int. Cl.[4] G01N *33/53*
U.S. Cl. 436—528 **12 Claims**



1. A method for determining the concentration of a physiologically active hapten in a concentration range of interest in a sample in which the hapten is soluble which comprises the steps of:

a. forming a mixture by mixing said sample with a soluble conjugate of said hapten covalently bound to an immunogenic carrier material and an antibody which will selectively bind said conjugate and measuring the optical density of resulting mixture at a wavelength of from 280 to 600 nm,

b. determining the amount of hapten present by comparing

the measured optical density with a standard curve obtained by separately mixing known amounts of said hapten with fixed amounts of said conjugate and said antibody at dilutions of maximum absorbance, determining the optical density of each resulting mixture at a wavelength of from 280 to 600 nm, and plotting decreasing optical density against increasing concentration of hapten,

the hapten to immunogenic carrier ratio in said conjugate being such that in the concentration range of interest the average slope of the standard curve is such as to give optimum sensitivity.

4,604,366

LEUCITE PORCELAIN

Joseph M. Kacicz, and Frank P. Fonvielle, both of York, Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Mar. 20, 1984, Ser. No. 591,387
Int. Cl.[4] C03C *10/10, 8/22, 8/14, 8/02*
U.S. Cl. 501—6 24 Claims

1. A porcelain raw material comprising:

a. a first glass material having a first fusion range at a temperature on the order of from about 750° C. to about 845° C., said first glass material consisting essentially of silicon dioxide, aluminum oxide, sodium monoxide and potassium oxide;

b. a second glass material having a second fusion range at a temperature that is lower than said first fusion range, said second fusion range being on the order of from about 700° C. to about 825° C., said second glass material consisting essentially of silicon dioxide, aluminum oxide, sodium monoxide and potassium oxide;

c. a first glass-ceramic material consisting essentially of a first amount of leucite crystals dispersed in a glassy phase matrix, said first glass-ceramic material consisting essentially of silicon dioxide, aluminum oxide, sodium monoxide and potassium oxide;

d. a second glass-ceramic material consisting essentially of a second larger amount of leucite crystals dispersed in a glassy phase matrix, said second glass-ceramic material having a coefficient of thermal expansion that is higher than that of said first glass-ceramic material and consisting essentially of silicon dioxide, aluminum oxide, iron oxide, sodium monoxide and potassium oxide, the respective amounts silicon dioxide, aluminum oxide, and sodium oxide in said first glass-ceramic material being greater than the amounts thereof in said second glass-ceramic material, and the amount of potassium oxide in said first glass-ceramic material being less than the amount thereof in said second glass-ceramic material;

e. said first and second glass materials comprising from 20 to 80 percent by weight of the total raw material and being present in a ratio of 1:10 to 10:1 of said first glass to said second glass;

f. said first and second glass-ceramic materials being present in a ratio of from 1:10 to 10:1; and

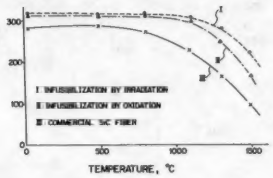
g. said first and second glass materials and said first and second glass-ceramic materials and the relative amounts thereof being selected such that, upon fusion, the resulting porcelain exhibits a coefficient of thermal expansion on the order of from about 10×10^{-6} in/in/°C. to about 19×10^{6} in/in/°C.

4,604,367

METHOD FOR THE PREPARATION OF AN INORGANIC FIBER CONTAINING SILICON, CARBON, BORON AND NITROGEN

Minoru Takamizawa; Taishi Kobayashi; Akira Hayashida, and Yoshihumi Takeda, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,796
Claims priority, application Japan, Dec. 27, 1983, 58-248030
Int. Cl.[4] C04B *35/02*
U.S. Cl. 501—95 8 Claims



1. A method for the preparation of an inorganic fiber comprising the elements of silicon, carbon, boron and nitrogen which comprises the steps of:

(a) heating a reaction mixture composed of an organosilicon compound having, in a molecule, at least one silicon-to-silicon linkage and at least one group denoted by R^1, R^1 being a hydrogen atom or a monovalent hydrocarbon group selected from the class consisting of methyl, ethyl, vinyl and phenyl groups, bonded to the silicon atom and an organoboron compound represented by the unit formula $—BR^2—NR^3—$, in which R^2 is a monovalent group selected from the class consisting of monovalent hydrocarbon groups, trihydrocarbylsilyl-substituted alkyl groups of the formula $—(CH_2)_nSiR^4_3$, R^4 being a monovalent hydrocarbon group and n being a positive integer, and substituted or unsubstituted amino groups of the formula $—NR^5_2$, R^5 being a hydrogen atom or a monovalent hydrocarbon group, and R^3 is a monovalent hydrocarbon group, in the molar ratio of silicon to boron in the range from 2:1 to 200:1 at a temperature in the range from 250° to 500° C. in an inert atmosphere to effect the thermal decomposition and polycondensation reaction of the reactants forming an organoborosilicon polymer having a number-average molecular weight in the range from 1,000 to 50,000;

(b) spinning the organoborosilicon polymer into a fibrous form;

(c) infusibilizing the thus formed fiber of the organoborosilicon polymer; and

(d) calcining the infusibilized fiber of the organoborosilicon polymer at a temperature in the range from 900° to 1800° C. in an atmosphere of vacuum or an inert gas.

4,604,368

METHOD OF PRODUCING AN ALUMINIUM BORIDE

Martin R. Reeve, Beaconsfield, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Jun. 19, 1984, Ser. No. 622,104
Claims priority, application United Kingdom, Jun. 24, 1983, 8317243
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—98 7 Claims

1. A method of forming a solid mixture of particles of an aluminium boride with a refractory material selected from borides and nitrides of groups IIIb, IVb, Vb and VIb metals, which method comprises providing a body of molten aluminium containing suspended particles of an aluminium boride, physically separating said suspended particles from the bulk of the molten metal by passing the body containing the suspended particles through a filter which is pervious to the molten aluminium but which retains the suspended particles, said filter

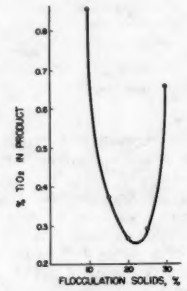
being constituted of a filter medium comprising a refractory material selected from borides and nitrides of groups IIIb, IV, Vb, and VIb metals, and thereafter recovering the filter medium containing retained aluminium boride particles separately from the bulk of the molten metal.

4,604,369

METHOD OF BENEFICIATING KAOLIN CLAY UTILIZING AMMONIUM SALTS

Joseph C. S. Shi, Bartow, Ga., assignor to Thiele Kaolin Company, Sandersville, Ga.

Filed Aug. 27, 1984, Ser. No. 644,614
Int. Cl.[4] C04B *33/04*
U.S. Cl. 501—148 **18 Claims**



1. A method of removing titanium impurities from kaolin clay comprising the following steps in sequence:

(A) blunging an aqueous kaolin clay suspension having 45 to 70 percent solids by weight, said suspension containing (i) an amount of dispersing agent sufficient to achieve minimum viscosity for said suspension and substantially free of excess dispersing agents, and (ii) 0.1 pounds to 10.0 pounds, per ton of dry clay, of a conditioning agent consisting essentially of a water-soluble ammonium salt;

(B) diluting the blunged clay suspension with an amount of water sufficient to form a clay slip having 10 to 40 percent solids by weight;

(C) adding 0.01 pounds to 5.0 pounds, per ton of dry clay, of a water-dispersible anionic polymer to said clay slip, whereby a separation of titanium-containing flocs is effected from said slip and

(D) separating a white claim product from said titanium-containing flocs;

wherein steps A, B and C are performed in a substantially continuous manner, without aging said blunged clay suspension or said clay slip.

4,604,370

PROCESS FOR REGENERATING A CATALYST

Kohei Sarumaru, Ami; Takeshi Shibano, Yokkaichi; Yoichi Ishii, and Etsuji Yamamoto, both of Ami, all of Japan, assignors to Mitsubishi Petrochemical Company, Limited, Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,136
Claims priority, application Japan, Jul. 23, 1984, 59-152651
Int. Cl.[4] B01J *23/92*; C07C *45/35*
U.S. Cl. 502—38 **6 Claims**

1. A process for regenerating a Mo.Bi-based multi-oxide catalyst which is used in the vapor-phase catalytic oxidation of propylene or isobutene into acrolein or methacrolein, respectively, the catalytic performance of which has deteriorated as a result of the use thereof in the vapor-phase oxidation at least partly because of sublimation of a portion of the molybdenum content of the catalyst, which process comprises:

heating the deteriorated Mo.Bi-based multi-oxide catalyst in an atmosphere consisting essentially of air at a temperature of 380° C. to 540° C., with the proviso that when the temperature ranges from 380° to 500° C., the heating is conducted for at least 12 hours and when the temperature ranges from 500° C. to 540° C., the heating is conducted for at least 2 hours, thereby restoring at least a portion of the performance capability of the catalyst.

2. The process of claim 1, wherein the vapor-phase catalytic oxidation is conducted over a fixed catalyst bed, and wherein the catalyst is regenerated by the prescribed treatment while in the state of a fixed bed.

3. The process of claim 1, wherein said catalyst has the formula: $Mo_aBi_bX_cO_d$, wherein X is a metal or metalloid other than Mo and Bi, a, b and c respectively represent the number of atoms of Mo, Bi and X in the catalyst and d is the number of oxygen atoms in the catalyst which is determined by the oxidation state of the Mo, Bi and X atoms.

4,604,371

OXIDATION CATALYST

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 461,942, Jan. 28, 1983, Pat. No. 4,481,363, which is a division of Ser. No. 289,806, Aug. 3, 1981, Pat. No. 4,388,221, and a continuation-in-part of Ser. No. 646,291, Aug. 29, 1984, which is a continuation-in-part of Ser. No. 461,942, Jan. 28, 1983, Pat. No. 4,481,363, which is a division of Ser. No. 289,806, , and a continuation-in-part of Ser. No. 492,163, May 6, 1983, Pat. No. 4,562,269, and a continuation-in-part of Ser. No. 492,226, May 6, 1983, each is a continuation-in-part of Ser. No. 275,370, Jun. 19, 1981, abandoned. This application Oct. 31, 1984, Ser. No. 666,997
The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.
Int. Cl.[4] B01J *27/18, 29/04, 29/06*
U.S. Cl. 502—60 **54 Claims**

1. An oxidation catalyst comprising components of vanadium, phosphorus, and tin in combination with a microporous crystalline silica or a crystalline zeolite having a silica-to-alumina ratio of at least 6.0, said vanadium being present in an average oxidation state less than 5.0.

41. An oxidation catalyst consisting essentially of components of tin, vanadium, and phosphorus in combination with a microporous crystalline silica or a crystalline zeolite having a silica-to-alumina ratio of at least 6.0, said vanadium being present in an average oxidation state between 3.50 and 4.95.

4,604,372

AGGLOMERATED ARTICLE OF MODIFIED ZEOLITE

Satoru Morishita, Kodaira; Kenzi Shindo, Toyama; Isao Tozawa, Toyama, and Yukio Taga, Toyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation of Ser. No. 710,952, Mar. 14, 1985, abandoned, which is a continuation of Ser. No. 381,873, May 25, 1982, abandoned. This application Nov. 25, 1985, Ser. No. 800,914
Claims priority, application Japan, May 28, 1981, 56-80183
Int. Cl.[4] B01J *20/18, 29/06*
U.S. Cl. 502—62 **5 Claims**

1. A zeolite agglomerated article which is formed from a zeolite composition comprising:

(a) a K-A zeolite which has been obtained by ion-exchanging a part of the sodium present in a Na-A zeolite with a potassium ion,

(b) at least one additive selected from the group consisting of alkaline earth metal oxides and hydroxides, and double salts containing an alkaline earth metal chloride, and

(c) a binder selected from the group consisting of sodium silicate, clays and organic binders, the amount of said binders being such that the ratio by weight of binder/zeolite is in the range of from 0.05 to 0.5.

4,604,373

HYDROCRACKING CATALYST OF IMPROVED ACTIVITY

Danford E. Clark, Fountain Valley, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 24, 1984, Ser. No. 644,329
Int. Cl.[4] B01J *29/10*
U.S. Cl. 502—65 32 Claims

1. A catalyst composition which comprises:

(a) a crystalline aluminosilicate Y zeolite having a silica-to-alumina mole ratio of about 6.2 or above, said zeolite having been ion-exchanged with rare earth containing cations and Group VIII noble metal-containing cations;

(b) a porous, inorganic refractory oxide intimately mixed with said zeolite; and

(c) between about 4.5 weight percent and about 6.5 weight percent water based on the total weight of said catalyst composition.

4,604,374

CATALYST PREPARED FROM ORGANOMAGNESIUM COMPOUND, EPIHALOHYDRIN REDUCING HALIDE SOURCE AND TRANSITION METAL COMPOUND

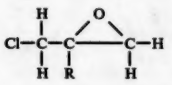
Gary K. Lund, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 20, 1982, Ser. No. 420,443
Int. Cl.[4] C08F *4/02, 10/00*
U.S. Cl. 502—115 4 Claims

1. A catalytic product resulting from admixing in an inert hydrocarbon diluent and in an atmosphere excludes moisture and oxygen

(A) at least one hydrocarbon soluble organomagnesium material represented by the formula $R_2Mg.xMeR'_{x'}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms; each R' is independently a hydrogen, hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms; Me is Al, Zn or B; x has a value from zero to 10 and is sufficient to render the organomagnesium component hydrocarbon soluble; and x' has a value equal to the valence of Me;

(B) at least one epihalohydrin represented by the formula



wherein R is hydrogen or an alkyl group having from 1 to about 10 carbon atoms;

(C) at least one reducing halide source represented by the formulas $Al(R^3)_{3-m}X_m$ and $B(R^3)_{3-m}X_m$ including mixtures thereof wherein each R^3 is independently hydrogen or a hydrocarbyl group as above defined, and m has a value from 1 to 2; and

(D) at least one transition metal (Tm) compound represented by the formula TmY_nX_{z-n}, wherein Tm is a transition metal in its highest stable valence state and being selected from groups IV-B, V-B and VI-B of the Periodic Table of the Elements; Y is oxygen, OR" or NR_2"; R" is hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms; X is a halogen, preferably chlorine or bromine; z has a value corresponding to the valence of the transition metal, Tm; n has a value of from zero to 5 with the value of z−n being from zero up to a value equal to the valence state of the transition metal, Tm; and wherein

(1) the components are added in the order (A), (B), (C) and (D) or (A), (B), (D) and (C);

(2) the components are employed in quantities so as to provide the following atomic ratios

Mg:Tm of from about 0.1:1 to about 100:1; Cl (from Component C):Mg of from about 2:1 to about 20:1; and

the epoxide:total number of hydrocarbyl groups attached to a metal atom in component (A) is from about 0.5:1 to 2:1; and

(3) the proviso that when the halide (from Component C):Mg atomic ratio is less than about 3:1 then the resultant mixture is heated at a temperature of from about 35° C. up to the boiling point of the inert hydrocarbon diluent, for a time to permit substantial reaction of the resultant mixture as indicated by a change in color of the mixture.

4,604,375

MANGANESE-SPINEL CATALYSTS IN CO/H_2 OLEFIN SYNTHESIS

Stuart L. Soled, Madison, and Rocco A. Fiato, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 20, 1983, Ser. No. 564,465
Int. Cl.[4] B01J *23/34*
U.S. Cl. 502—241 15 Claims

1. A hydrocarbon synthesis catalyst composition comprising a bulk unsupported Group IA or IIA metal salt promoted iron-manganese single phase, said single phase comprising a spinel having the empirical formula:

$$Fe_xMn_yO_4$$

wherein x and y are integer or decimal values, other than zero, with the proviso that the sum of x+y is 3 and the ratio of x/y is 2:1 to 19:1 and said spinel exhibiting a powder X-ray diffraction pattern substantially isostructural with Fe_3O_4 and said metal salt being substantially deposited on the surface of said spinel.

4,604,376

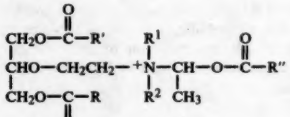
ENTERIC COMPOUNDS AND COMPLEXES

Lin-nar L. Teng, Bothell, Wash., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 370,155, Apr. 21, 1982, Pat. No. 4,510,135, and a continuation-in-part of Ser. No. 452,493, Dec. 23, 1982. This application Apr. 8, 1985, Ser. No. 720,664
Int. Cl.[4] A61K *37/26;* C07K *7/40*
U.S. Cl. 514—3 28 Claims

1. An enterally effective, biologically active peptide or protein composition, comprising:

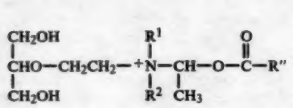
a sandwich complex comprising a hydrophobic core complex of a biologically active peptide or protein with an alkyl or alkenyl sulfate having 6–24 carbon atoms and 0–3 double bonds, said core complex forming an electrostatic complex with a quaternary ammonium ion selected from the group consisting of:



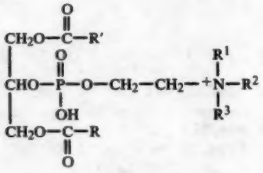
where

R^1 and R^2 are the same or different and are alkyl or hydroxy substituted alkyl containing 1 to 6 carbon atoms; and

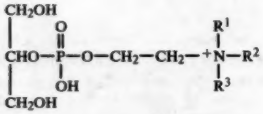
R, R' and R" are the same or different and are saturated or unsaturated aliphatics containing at least 10 carbon atoms;



where R^1, R^2 and R'' have the meanings given above;



where R^3 is independently alkyl or hydroxy substituted alkyl containing at least 10 carbon atoms; and R^1, R^2, R and R' have the meanings given above; and



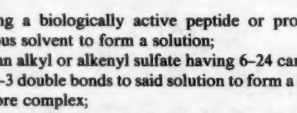
where R^1, R^2 and R^3 have the meanings given above.

16. A method of producing an enterally effective, biologically active peptide or protein composition, comprising the steps of:

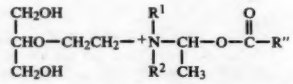
dissolving a biologically active peptide or protein in an aqueous solvent to form a solution;

adding an alkyl or alkenyl sulfate having 6–24 carbon atoms and 0–3 double bonds to said solution to form a hydrophobic core complex;

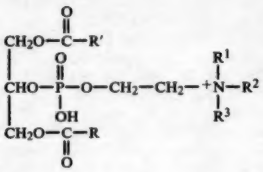
adding a quaternary ammonium ion to the solution of said core complex, wherein said ammonium ion is selected from the group consisting of



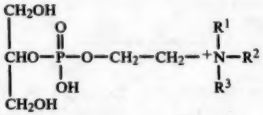
where R^1 and R^2 are the same or different and are alkyl or hydroxy substituted alkyl containing 1 to 6 carbon atoms; and R, R' and R'' are the same or different and are saturated or unsaturated aliphatics containing at least 10 carbon atoms;



where R^1, R^2 and R'' have the meanings given above;



where R^3 is independently alkyl or hydroxy substituted alkyl containing at least 10 carbon atoms; and R^1, R^2, R and R' have the meanings given above; and



where R^1, R^2 and R^3 have the meanings given above thereby forming a sandwich complex comprising said hydrophobic core complex in an electrostatic complex with said ammonium ion.

4,604,377

PHARMACEUTICAL COMPOSITIONS OF MICROBIALLY PRODUCED INTERLEUKIN-2

Pete M. Fernandes, Lafayette, and Terrance A. Taforo, Oakland, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 594,350, Mar. 28, 1984, abandoned. This application Mar. 21, 1985, Ser. No. 715,152

The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.

Int. Cl.[4] **A61K** *45/02, 37/02, 39/39;* **C07K** *13/00*

U.S. Cl. 514—8 **15 Claims**

1. A recombinant IL-2 composition suitable for reconstituting in a pharmaceutically acceptable aqueous vehicle for parenteral administration to a patient to provide IL-2 therapy comprising a sterile lyophilized mixture of:

(a) a therapeutically effective amount of a selectively oxidized microbially produced recombinant IL-2 that is substantially free of non-IL-2 protein, and it is at least 95% pure recombinant IL-2, and contains less than about 5 ng endotoxin per 100,000 units of IL-2 activity;

(b) a physiologically acceptable water soluble carrier that does not affect the stability of the selectively oxidized microbially produced IL-2 adversely; and

(c) a sufficient amount of a surface active agent to ensure the water solubility of the selectively oxidized, microbially produced hydrophobic recombinant IL-2.

4,604,378

BASIC V_1-VASOPRESSIN ANTAGONISTS

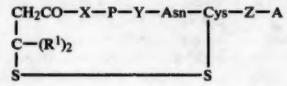
James F. Callahan, Philadelphia; William F. Huffman, Malvern; Michael L. Moore, Media, and Nelson C. Yim, Ambler, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Nov. 21, 1984, Ser. No. 673,829

Int. Cl.[4] **C07K** *7/16;* **A61K** *37/34*

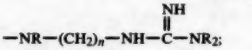
U.S. Cl. 514—11 **12 Claims**

1. A polypeptide compound having the formula:



in which:

A is —NR—$(CH_2)_n$—NR_2 or



P is Phe, Ile, Phe(4'-Alk), Tyr or Tyr(Alk);

X is a D or L isomer of Val, Nva, Leu, Ile, Pba, Phe, Phe(4'-Alk), Trp, Nle, Cha, Abu, Met, Chg, Tyr or Tyr(Alk);

Y is Val, Ile, Abu, Ala, Chg, Gln, Lys, Cha, Thr, Nle, Phe, Leu or Gly;

z is Gly, Sar, a single bond or a D or L isomer of Pro, Δ^3-Pro, Ala or N-Me-Ala;

R^1 is, each, hydrogen or methyl;

n is an integer from 2–8;

R is, each, hydrogen or methyl; and Alk is an alkyl group 1–4 carbons; or a pharmaceutically acceptable salt thereof.

4,604,379

DIALYSIS SOLUTIONS CONTAINING CROSS-LINKED GELATIN

Zbylut J. Twardowski, and Karl D. Nolph, both of Columbia, Mo., assignors to Curators of the University of Missouri, Columbia, Mo.

Filed Jun. 18, 1984, Ser. No. 621,392

Int. Cl.[4] C08L *89/04, 89/06;* **C09H** *7/00*

U.S. Cl. 514—21 **6 Claims**

1. A peritoneal dialysis solution comprising

an osmotic agent operative, when said solution is present in the peritoneal cavity, to induce and sustain the ultrafiltration of water from the blood into said solution through the peritoneum, said osmotic agent comprising gelatin which is chemically cross-linked to suppress gelatin and which has an isoelectric point at a pH below about 5, said cross-linked gelatin being essentially free of synthetically added, pendant ionizable groups, and

a quantity of physiological cations present to maintain said solution at a pH above about 5 to create a normally anionic charge on said cross-linked gelatin and to cause said cross-linked gelatin to assume a salt form.

4,604,380

C-23-SUBSTITUTED MYCAMINOSYLTYLONOLIDE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

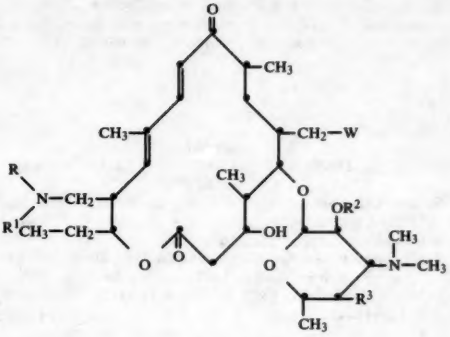
Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 18, 1985, Ser. No. 692,484

Int. Cl.[4] A61K *31/71;* **C07H** *17/08*

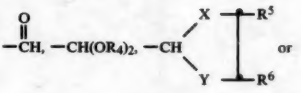
U.S. Cl. 514—30 **38 Claims**

1. A compound of the formula:

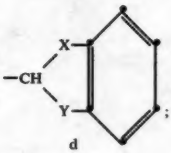


wherein

W represents



a b c

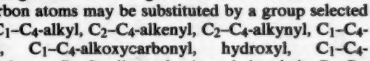


d

R is a bicyclic or tricyclic ring system containing from 6 to 18 carbon atoms; and

R^1 is hydrogen, C_1–C_4-alkyl or benzyl; or

R and R^1 together form a bicyclic or tricyclic ring system containing from 8 to 20 ring atoms wherein from 1 to 3 of the carbon atoms may be substituted by a group selected from C_1–C_4-alkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, hydroxyl, C_1–C_4-alkanoyloxy, C_1–C_4-alkanoylamino, halo, halo-C_1–C_4-alkyl, —$N(C_1$–C_4-alkyl$)_2$, —$N(CH_2)_m$,



cyano, ethylenedioxy, benzyl, phenyl, or phenyl substituted by from 1 to 3 substituents selected from nitro, halo, C_1–C_4-alkyl, C_1–C_4-alkoxy, hydroxy, amino, or mono- or di-(C_1–C_4-alkyl)amino; and

m is an integer from 4 through 7;

R^2 is hydrogen; C_1–C_5-alkanoyl; C_1–C_5-alkanoyl having 1 to 3 halo substituents; benzoyl, phenylacetyl or phenylpropionyl; or benzoyl, phenylacetyl or phenylpropionyl having 1 to 5 halo or methyl or 1 to 2 methoxyl, nitro or hydroxyl substituents on the phenyl ring;

R^3 is hydrogen or —OR^2;

R^4 is C_1–C_4-alkyl;

R^5 and R^6, independently, are hydrogen, methyl, ethyl, phenyl, methoxycarbonyl, ethoxycarbonyl or phenoxycarbonyl;

X and Y, independently, represent O, S or NR^7; and

R^7 is hydrogen, methyl, ethyl, phenyl or benzyl;

or its acid addition salt.

33. A composition useful for the treatment of bacterial or mycoplasmal infections comprising an effective amount of a compound of claim 1 or its pharmaceutically acceptable acid addition salt and a suitable pharmaceutical vehicle.

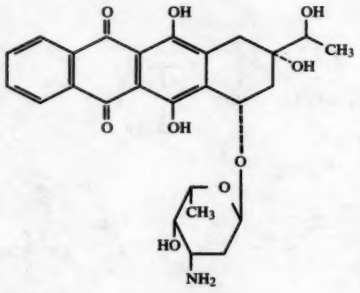
4,604,381

4-DEMETHOXY-13-DIHYDRODAUNORUBICIN AND USE THEREOF

Sergio Penco, Milan; Federico Arcamone, Nerviano, and Anna Maria Casazza, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Continuation of Ser. No. 398,987, Jul. 16, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 668,178
Int. Cl.[4] A61K *31/71*; C07H *15/24*
U.S. Cl. 514—34 3 Claims

1. An anthracycline glycoside having the formula:



and its pharmaceutically acceptable acid addition salts.

2. A method of inhibiting the growth of a tumor selected from the group consisting of P 388 leukemia and Gross leukemia, said method comprising administering to a host afflicted therewith, a therapeutically effective amount of the anthracycline glycoside as claimed in claim 1.

4,604,382

3'-AMINO-2',3'-DIDEOXYCYTIDINE AND THE PHARMACOLOGICALLY ACCEPTABLE SALTS THEREOF

Tai-Shun Lin, North Haven, and William H. Prusoff, Branford, both of Conn., assignors to Research Corporation, New York, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,335
Int. Cl.[4] A61K *31/70*; C07H *17/00*
U.S. Cl. 514—49 5 Claims

1. A compound selected from the group consisting of 3'-amino-2',3'-dideoxycytidine and the pharmacologically acceptable acid addition salts thereof.

3. A pharmaceutical composition in dosage unit form comprising from about 50 milligrams to about 300 milligrams of a compound selected from the group consisting of 3'-amino-2',3'-dideoxycytidine and the pharmacologically acceptable acid-addition salts thereof in association with a pharmaceutical carrier.

4. The method of inducing regression of leukemia and/or inhibiting growth of tumors in a mammal comprising administering to said mammal an effective antineoplastic amount of a compound selected from the group consisting of 3'-amino-2,3'-dideoxycytidine and the pharmalogically acceptable acid-addition salts thereof.

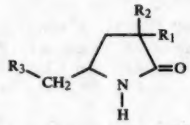
4,604,383

PYRROLIDIN-2-ONES AND MEDICAMENTS CONTAINING THEM

Kathleen Biziere, Clapiers; Jean-Pierre Chambon, Montarnaud, and Jean-Charles Molimard, Saint-Gely-du-Fesc, all of France, assignors to Societe Anonyme Styled: SANOFI, Paris, France

Filed Jul. 5, 1984, Ser. No. 628,211
Claims priority, application France, Jul. 12, 1983, 83 11636
Int. Cl.[4] C07D *207/26, 409/06*; A61K *31/40*
U.S. Cl. 514—63 8 Claims

1. Pyrrolidinones of the formula:



(I)

in which:

R_1 represents a hydrogen atom or a straight or branched alkyl group having 1 to 4 carbon atoms;

R_2 represents a straight or branched alkyl group having 1 to 4 carbon atoms, a phenyl group or a trimethylsilyl group;

R_3 represents a 2-thienyl group, an unsubstituted phenyl group, or a phenyl group substituted by one or two halogen atoms, methyl groups, methoxy groups, or trifluoromethyl groups.

7. A pharmaceutical composition for treatment of psychic, neurological or neuromuscular disorders, containing as active ingredient an effective amount for treating said disorders of at least one compound according to claim 1, in association with a pharmaceutically acceptable vehicle.

4,604,384

PHARMACEUTICAL GEL COMPOSITION

Robert A. Smith, 42 Bigge Street, Liverpool, New South Wales, 2170, and Maxine Goodman, 8/95 Chiswick Road, Greenacre, New South Wales 2190, both of Australia

PCT No. PCT/AU83/00081, § 371 Date Jan. 23, 1984, § 102(e) Date Jan. 23, 1984, PCT Pub. No. WO84/00111, PCT Pub. Date Jan. 19, 1984
PCT Filed Jun. 21, 1983, Ser. No. 584,941
Claims priority, application Australia, Jun. 24, 1982, PF4583
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—179 19 Claims

1. A composition for use in the treatment of burns, cuts, wounds, abrasions and the like consisting essentially of, per 100 parts by weight of composition,

from 20 to 30 parts by weight of propylene glycol,

from 1 to 4 parts by weight of hydroxy ethyl cellulose,

from 0 to 2 parts by weight of sodium chloride, and

the balance water, said composition being substantially sterile.

4,604,385

PERFLUORO-1-AZATRICYCLIC AMINE COMPOUNDS USEFUL AS OXYGEN CARRIERS IN ARTIFICIAL BLOOD AND INFUSION FLUIDS

Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa, Suita; Yoshihisa Inoue, Kyoto; Youichiro Naito, Hirakata, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

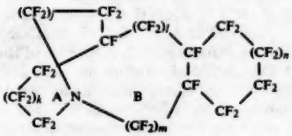
Division of Ser. No. 505,322, Jun. 17, 1983, Pat. No. 4,542,147. This application Jul. 5, 1985, Ser. No. 751,851

Claims priority, application Japan, Aug. 7, 1982, 57-137663; Aug. 7, 1982, 57-137664; Aug. 7, 1982, 57-137665

Int. Cl.[4] **A61K** *31/395, 31/55;* **C07D** *487/08*

U.S. Cl. 514—183 **9 Claims**

1. A perfluoro-1-azatricyclic amine compound represented by the formula:



wherein j, k, l and m are each an integer of from zero to 3 so as to make one of the rings A and B to be 7 or more members; n is zero or 1; any one fluorine of the formula optionally being replaced by a trifluoromethyl group.

7. A composition for use as a blood substitute or infusion fluid which composition is an aqueous emulsion of a compound according of claim **1**.

4,604,386

3-(ALKYNYLALKYLOXY) CEPHALOSPORINS

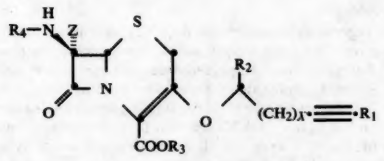
Douglas O. Spry, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 9, 1984, Ser. No. 629,014

Int. Cl.[4] **A61K** *31/545;* **C07D** *501/18, 501/20*

U.S. Cl. 514—200 **59 Claims**

1. A compound of the formula:



wherein:

R_1 is hydrogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxycarbonyl, C_1 to C_4 alkylthio, or phenylthio or halo;

R_2 is hydrogen, C_1 to C_4 alkyl, phenyl, benzyl or phenethyl;

R_3 is hydrogen, a carboxy protecting group, a pharmaceutically acceptable, non-toxic salt of the carboxy group, a hydrate of said salt, or a non-toxic, metabolically labile ester of the carboxy group; and

R_4 is

(a) hydrogen, or a salt of said compound;

(b) an amino-protected group;

(c) a group of the formula:

wherein

R_5 is

(i) 1,4-cyclohexadienyl, 1-cyclohexenyl, phenyl or substituted phenyl wherein the substituents are 1 or 2 halogens, hydroxy, protected hydroxy, nitro, cyano, trifluoromethyl, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, carboxy, protected carboxy, carboxymethyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, protected aminomethyl, or N-(methylsulfonylamino);

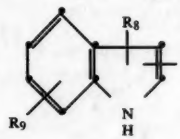
(ii) an arylalkyl group of the formula

wherein y is O or S, m is 0 or 1, R_6 is R_5 as defined above, and when m is 0, R_6 is also 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 1-tetrazolyl, 5-tetrazolyl, 2-thiazolyl, 2-aminothiazol-4-yl, or 2-(protected amino)thiazol-4-yl; or

(iii) a substituted arylalkyl group of the formula

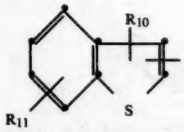
wherein

R_7 is R_6 as defined above, 2- or 3-indolyl, a substituted 2- or 3-indolyl group of the formula



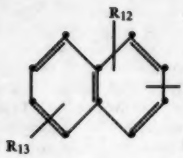
in which

R_8 and R_9 independently are hydrogen, halo, hydroxy, protected hydroxy, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, nitro, amino, protected amino, C_1 to C_4 alkanoylamino, C_1 to C_4 alkylsulfonylamino, or when R_8 and R_9 are on adjacent carbons, they may be taken together to form methylenedioxy, 2- or 3-benzothienyl, 2- or 3-substituted benzothienyl of the formula



in which

R_{10} and R_{11} are independently hydrogen, halo, hydroxy, protected hydroxy, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, nitro, amino, protected amino, C_1 to C_4 alkanoylamino, C_1 to C_4 alkylsulfonylamino, and when R_{10} and R_{11} are on adjacent carbon atoms, they can be taken together to form methylenedioxy; 1- or 2-naphthyl, substituted 1- or 2-naphthyl of the formula



wherein

R_{12} and R_{13} are independently hydrogen, halo, hydroxy, protected hydroxy, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, nitro, amino, protected amino, C_1 to C_4 alkanoylamino, C_1 to C_4 alkylsulfonylamino, or when R_{12} and R_{13} are on adjacent carbon atoms, they can be taken together to form methylenedioxy;

W is hydroxy, protected hydroxy, carboxy, a carboxy salt, protected carboxy, amino, a salt of said amino compound, or protected amino; provided that,

when W is other than amino, a salt of said amino compound or protected amino, R_7 is other than 2 or 3-indolyl, substituted 2- or 3-indolyl, 2- or 3-benzothienyl, 2- or 3-substituted benzothienyl, 1- or 2-naphthyl, or substituted 1- or 2-naphthyl; and wherein X is 0 to 4 and Z is hydrogen or methoxy.

4,604,387

1,2,4-TRIAZINYLTHIOMETHYL-3-CEPHEM SULFOXIDES, AND A PROCEDURE FOR THEIR PREPARATION

Bernard Labeeuw, Montpellier, and Ali Sahli, St Gely du Fesc, both of France, assignors to Sanofi, Paris, France

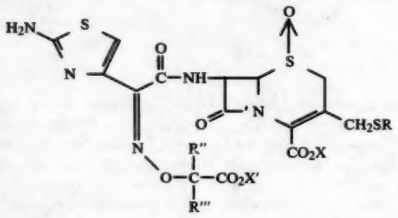
Continuation of Ser. No. 277,839, Jun. 26, 1981, abandoned. This application Aug. 23, 1983, Ser. No. 525,797

Claims priority, application France, Jun. 30, 1980, 80 14512; Mar. 3, 1981, 81 04242; Mar. 3, 1981, 81 04243

Int. Cl.[4] A61K *31/545*; **C07D** *501/60*

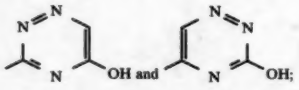
U.S. Cl. 514—206 **4 Claims**

1. A cephalosporin derivative having the formula



wherein the sulfoxide function is in the (S) stereoisomeric form;

R is selected from the group consisting of



R'' and R''' each separately represents hydrogen or alkyl of from one to three carbons, or, R'' and R''' taken together with the carbon to which they are attached constitute a cyclobutyl or cyclopentyl ring; and

X and X' are separately selected from the group consisting of

hydrogen;

alkali metal cations;

alkaline earth cations;

cations resulting from protonation of a compound selected from the group consisting of ethylenediamine, triethanolamine, diethanolamine, ethanolamine, and tromethamine;

tertiary butyl;

organic radicals selected from the group consisting of phthalidyl, pivaloyl oxymethyl, acetoxymethyl, ethoxycarbonyl-oxymethyl, 1-(ethoxy carbonyloxy)ethyl, acetonyl, alpha-methoxy-alpha-carbomethoxy methyl, carbomethoxymethyl, and carbethoxymethyl;

or a pharmaceutically-acceptble acid addition salt of the compound in which X is H, tertiary butyl, or said organic radical.

4,604,388

FUSED AROMATIC OXAZEPINONES, THIAZEPINONES, DIAZEPINONES AND SULFUR ANALOGS THEREOF IN A METHOD OF COUNTERACTING HISTAMINE

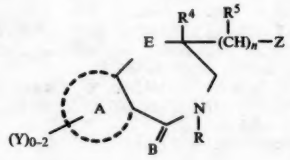
Charles A. Leonard; Bernard V. Franko, both of Richmond, and Albert D. Cale, Jr., Mechanicsville, all of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 652,007, Sep. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,558, Aug. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 431,998, Sep. 30, 1982, abandoned. This application Jul. 9, 1985, Ser. No. 753,325

Int. Cl.[4] A61U *31/55*

U.S. Cl. 514—211 **258 Claims**

1. A method of counteracting histamine in a living animal body which comprises administering to said animal body an effective amount of a compound selected from the group having the formula:



wherein;

A represents an aromatic ring having two of its carbon atoms held mutually with the oxazepine, thiazepine, or diazepine moiety selected from the group consisting of benzene, naphthalene, a quinoline, or a pyridine in any of its four positions, any of the rings optionally substituted by one or two Y radicals selected from the group consisting of halo, loweralkyl, loweralkoxy, diloweralkylamino, nitro or trifluoromethyl;

E is selected from oxygen, sulfur or

B is selected from oxygen or sulfur;

R is selected from the group consisting of hydrogen, loweralkyl, cycloalkyl or phenyl-loweralkyl of which phenyl may be optionally substituted by one or two radicals selected from halo, loweralkyl, loweralkoxy, nitro, or trifluoromethyl;

n is 1, 2 or 3;

R^4 and R^5 are selected from hydrogen or loweralkyl (1–5 C);

Z is selected from the group consisting of $—NR^1R^2$, 1H-pyrazol-1-yl, 1H-imidazol-1-yl, 1H-imidazol-2-yl or 4,5-dihydro-1H-imidazol-2-yl;

R^1 and R^2 are selected from the group consisting of hydrogen, loweralkyl, cycloalkyl and phenyl-loweralkyl of which phenyl may be optionally substituted by 1 or 2 radicals selected from halo, loweralkyl, loweralkoxy, nitro, trifluoromethyl or cyano, or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-azetidinyl, 1-pyrrolidinyl, 2,5-dimethylpyrrolidin-1-yl, 2-methylpyrrolidin-1-yl, 1-piperidinyl, 4-substituted piperidin-1-yl, 4-[bis(4-fluorophenyl)methyl]piperidin-1-yl, 4-morpholinyl, 1-piperazinyl, 4-substituted piperazin-1-yl, 1,2,3,6-tetrahydropyridin-1-yl, 1H-pyrrol-1-yl or 2,5-dihydro-1H-pyrrol-1-yl; the optical isomers thereof and the pharmaceutically acceptable salts thereof with the proviso that when R=H, Z is never a primary or secondary amine and a further proviso that when n=4, Z is not pyrazolyl or imidazolyl.

4,604,389

BENZAZEPINE DERIVATIVES

Manfred Reiffen, Biberach; Klaus Noll; Joachim Heider, both of Warthausen; Volkhard Austel; Norbert Haüel, both of Biberach, all of Fed. Rep. of Germany; Walter Kobinger, and Christian Lillie, both of Vienna, Austria, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

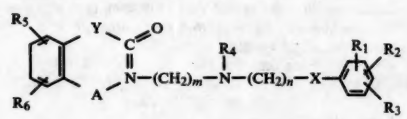
Filed May 8, 1985, Ser. No. 732,204

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418271

Int. Cl.[4] **A61K** *31/55;* **C07D** *223/16, 491/55, 521/00*

U.S. Cl. 514—213 **10 Claims**

1. A compound of formula



wherein

A is $—CH_2CH_2—$ or $—CH=CH—$;

R_1 is hydrogen, chlorine, bromine, C_1–C_3 alkyl, amino, C_1–C_3 alkylamino, C_1–C_3 dialkylamino, acylamino, hydroxy, C_1–C_3 alkoxy or phenyl C_1–C_3 alkoxy;

R_2 is hydrogen, chlorine, bromine, hydroxy, C_1–C_3 alkyl, C_1–C_3 alkoxy or phenyl C_1–C_3 alkoxy or, together with R_1, can be C_1–C_2 alkylenedioxy;

R_3 is hydrogen, chlorine, bromine or C_1–C_3 alkoxy;

R_4 is hydrogen, benzyl, C_1–C_3 alkyl or C_3–C_5 alkenyl;

R_5 is hydrogen, halogen, C_1–C_3 alkyl or C_1–C_3 alkoxy;

R_6 is hydrogen, C_1–C_3 alkyl or C_1–C_3 alkoxy or together with R_5, can be a C_1–C_2 alkylenedioxy;

X is imino, optionally substituted by a benzyl or C_1–C_3 alkyl, or is oxygen, sulphur, sulfinyl or sulfonyl;

Y is imino, optionally substituted by a benzyl, or C_1–C_3 alkyl, or is methylene or carbonyl; and

m and n are each independently 2, 3 or 4;

or a nontoxic, pharmaceutically acceptable addition salts thereof.

10. A method of reducing the oxygen requirement of the heart in a human or animal in need thereof, which method comprises administering to said human or animal an effective amount of a compound of any of claims 1, 2 or 3.

4,604,390

ANTIBACTERIAL BENZO(CHALCOGENO)[4,3,2-CD]INDAZOLES

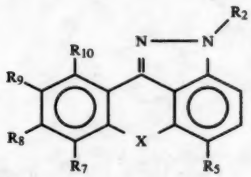
Edward F. Elslager; Leslie M. Werbel, both of Ann Arbor; Daniel F. Ortwine, Saline; Donald F. Worth, Ann Arbor; Howard D. H. Showalter, Ann Arbor; David B. Capps, Ann Arbor; Ellen M. Berman, Ann Arbor; Vlad E. Gregor, Ann Arbor, and Anthony D. Sercel, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 626,090, Jun. 29, 1984, abandoned, and a continuation-in-part of Ser. No. 626,170, Jun. 29, 1984, abandoned, and a continuation-in-part of Ser. No. 559,402, Dec. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 456,162, Jan. 6, 1983, abandoned. This application May 24, 1985, Ser. No. 738,195

Int. Cl.[4] **A61K** *31/415, 31/54;* **C07D** *491/06, 517/06*

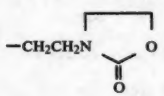
U.S. Cl. 514—222 **46 Claims**

1. A benzo(chalcogeno)[4,3,2-cd]indazole compound having the structural formula

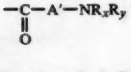


or a pharmaceutically acceptable salt thereof, wherein X is oxygen, sulfur, or selenium; the substituents R_7, R_8, R_9, and R_{10} are independently hydrogen, hydroxy, alkoxy of from 1 to 4 carbon atoms wherein R_2 is $—ANR'R''$ wherein A is a straight or branched alkylene chain of from 2 to 5 carbon atoms optionally substituted with hydroxyl; wherein R′ and R″ are hydrogen or are straight or branched alkyl of from 1 to 4 carbon atoms optionally substituted with hydroxyl, or where R′ and R″ taken together also represent

wherein m and n are each 2 and B is a direct bond, or oxygen, sulfur, or NR''' wherein R‴ is hydrogen or straight or branched alkyl of from 1 to 4 carbon atoms optionally substituted with hydroxyl; and wherein R_5 is nitro, NH_2, NHR_2, or NHR'''' where R⁗ is



or is



wherein A′ is a straight or branched alkylene chain of from 1 to 5 carbon atoms, and R_x and R_y are independently hydrogen or straight or branched alkyl of from 1 to 4 carbon atoms optionally substituted with hydroxyl.

46. A method of treating bacterial infections in a mammal comprising administering to a mammal in need of such treatment an antibacterially effective amount of a compound as

defined by claim 1 in combination with a pharmaceutically acceptable carrier.

4,604,391

TREATMENT OF OSTEITIS AND OSTEOMYELITIS EMPLOYING THIADIAZINE COMPOUNDS

Rolf W. Pfirrmann, Lucerne, Switzerland, assignor to Ed Geistlich Sohne AG fur Chemische Industrie, Switzerland

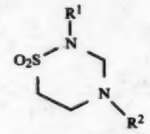
Filed Oct. 19, 1984, Ser. No. 662,885

Claims priority, application United Kingdom, Oct. 20, 1983, 8328073

Int. Cl.[4] A61K *31/54*

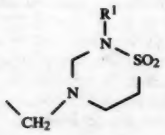
U.S. Cl. 514—222 **4 Claims**

1. A method of treating a human or warm-blooded animal patient suffering from bone injury to prevent the occurrence of osteitis or osteomyelitis, said method comprising administering systemically to said patient a therapeutically effective amount of a compound of formula (I)



(I)

wherein R^1 represents a hydrogen atom or an alkyl group having from 1 to 6 carbon atoms and R^2 represents a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms or a group of formula (II)



(II)

in which R^1 is as defined above.

4,604,392

2-SUBSTITUTED BENZOFURAN DERIVATIVES USEFUL IN TREATING CARDIAC ARRHYTHMIC, HISTAMINIC AND TUSSIVE CONDITIONS

Vittorio Pestellini; Mario Ghelardoni; Carlo Alberto Maggi, Florence; Gabrio Roncucci, Siena, and Alberto Meli, Florence, all of Italy, assignors to A. Menarini S.A.S., Italy

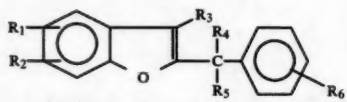
Division of Ser. No. 468,869, Feb. 22, 1983, Pat. No. 4,485,112, which is a continuation-in-part of Ser. No. 253,551, Apr. 13, 1981, abandoned. This application Aug. 17, 1984, Ser. No. 641,606

Claims priority, application Italy, Nov. 12, 1980, 9583 A/80

Int. Cl.[4] A61K *31/535;* **C07D** *295/08*

U.S. Cl. 514—227 **24 Claims**

1. A compound selected from the group consisting of compounds having the formula



and pharmaceutically acceptable salts thereof, in which:

R_1 and R_2 which can be the same or different are selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group containing 1 to 4 carbons atoms, a phenyl lower alkyl group, a naphthyl lower alkyl group, a phenyl group, a naphthyl group, a hydroxyl group, a lower alkoxy group, an NH_2 group, an NH-lower alkyl group, an N(lower alkyl)$_2$ group, an NH(CO-lower alkyl) group, an NH(CO-phenyl) group, an NH(CO-naphthyl) group, and an NO_2 group, and a ring of 5–8 carbon atoms including both R_1 and R_2;

R_3 is selected from the group consisting of a hydrogen atom, an alkyl group containing 1 to 4 carbon atoms, a phenyl group and a naphthyl group;

R_4 is selected from the group consisting of a hydrogen atom, a lower alkyl group, a phenyl group, a naphthyl group, a phenyl lower alkyl group, and a naphthyl lower alkyl group;

R_5 is selected from the group consisting of N-piperidyl, N-morpholino, N-piperazino, substituted N-piperidyl which is substituted with a substituent selected from the group consisting of lower alkyl, hydroxy lower alkyl, phenyl, naphthyl and pyridyl, substituted N-morpholino which is substituted with a substituent selected from the group consisting of lower alkyl, hydroxy lower alkyl, phenyl, naphthyl and pyridyl, and substituted N-piperazino which is substituted with a substituent selected from the group consisting of lower alkyl, hydroxy lower alkyl, phenyl, naphthyl and pyridyl; and

R_6 is selected from the group consisting of a hydrogen atom, a halogen atom, a lower alkyl group, a phenyl lower alkyl group, a naphthyl lower alkyl group, a phenyl group, a naphthyl group, a hydroxyl group, a lower alkoxy group, an NH_2 group, an NH-lower alkyl group, an N(lower alkyl)$_2$ group, an NHCO-lower alkyl group, an NHCO-phenyl group, an NHCO-naphthyl group, and an NO_2 group.

4,604,393

PHENYLOXOALKYL PIPERIDINES AND THE PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

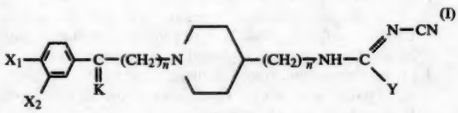
Pierre-Jean Cornu, 100, Avenue Kleber, F-75116, Paris; Claude Perrin, 5, rue de 1-Avenir, F-91400, Orsay; Bernard Dumaitre, 24, rue Chemin Vert., F-93000, Bobigny, and Gilles Streichenberger, 30, boulevard du Chateau, F-92200, Neuilly sur Seine, all of France

Filed Jan. 30, 1984, Ser. No. 575,022

Int. Cl.[4] C07D *211/26, 211/58, 405/06, 413/12, 413/14;* **A61K** *31/535, 31/445*

U.S. Cl. 514—229 **6 Claims**

1. The phenyloxoalkyl piperidines of the formula



(I)

wherein

X_1 is hydrogen or fluoro, and

X_2 is hydrogen,

K is the oxygen of a ketonic group or the grouping

wherein R_1 and R_2 are a lower alkyl radical or together are a lower alkylene radical

Y is selected from the group consisting of a radical ZR_5

wherein Z is an oxygen or a sulphur atom and R_5 is a lower alkyl radical or an amino group of the formula

wherein R_3 is a lower alkyl radical, a lower alkenyl radical, a lower cycloalkyl radical or morpholino

R_4 is hydrogen

n is 1, 2 or 3

n' is zero or 1

and the addition salts thereof with therapeutically acceptable acids.

4. A pharmaceutical composition containing as active ingredient at least one compound according to claim 1 in admixture or conjunction with a pharmaceutically acceptable carrier or vehicle.

4,604,394

ANTIARRHYTHMIC COMPOSITIONS AND METHOD

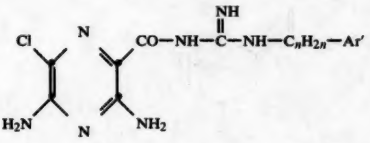
Gregory J. Kaczorowski, Edison, N.J., and Peter K S. Siegl, Blue Bell, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 1, 1984, Ser. No. 655,777

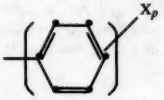
Int. Cl.[4] A61K *31/495*

U.S. Cl. 514—255 **10 Claims**

1. A method for treating cardiac arrhythmias which comprises administering to a subject in need of such treatment, a therapeutically effective amount of a pyrazinoylguanidine compound of the formula

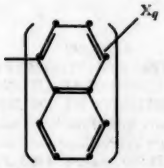


wherein Ar' may be represented by:



(i)

or



(ii)

wherein each X independently may be halo, lower alkyl, lower alkoxy and nitro, p is from 1 to 3 and q is from 0 to 2; and wherein n is from 1 to 2; or

pharmaceutically acceptable salts thereof.

4,604,395

1-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-4-(SUBSTITUTED)PIPERAZINES

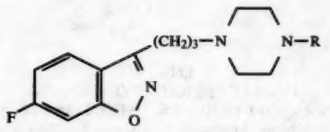
Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 366,248, Apr. 9, 1982, Pat. No. 4,536,578. This application Jun. 7, 1985, Ser. No. 742,332

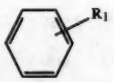
Int. Cl.[4] A61K *31/445, 31/495*

U.S. Cl. 514—255 **12 Claims**

1. A method of treating psychoses comprising administering to a mammal in need of psychoses treatment a psychoses treating effective amount of a compound of the formula



wherein R is loweralkyl, benzyl, 2-hydroxyethyl, pyridyl or a group of the formula



wherein R_1 is hydrogen, loweralkyl, loweralkoxy, halogen or trifluoromethyl; the optical antipode thereof; or a pharmaceutically acceptable acid addition salt thereof.

4,604,396

[(2,3,9,9A-TETRAHYDRO-3-OXO-9A-SUBSTITUTED-1H-FLUOREN-7-YL)OXY]ETHANIMIDAMIDES AND [(2,3,9,9A-TETRAHYDRO-3-OXO-9A-SUBSTITUTED-1H-FLUOREN-7-YL)OXY]ETHANIMIDIC ACID HYDRAZIDES, THEIR DERIVATIVES AND THEIR SALTS

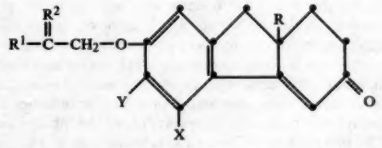
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 26, 1985, Ser. No. 780,145

Int. Cl.[4] A61K *31/505, 31/155;* C07D *123/00*

U.S. Cl. 514—256 **12 Claims**

1. A compound of the formula:



wherein:

R is lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms, aryl, halo substituted aryl, aralkyl, cycloalkyl containing from 3 to 6 nuclear carbon atoms, or cycloalkyl-lower alkyl containing from 4 to 7 total carbon atoms;

R^1 is NH_2, NHR^3 or NR^3R^4;

R^2 is NH or NR^3;

R^3, R^4 are each independently lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms, or amino, provided that R^3 and R^4 are not both amino;

wherein R^1 and R^2 may be joined together via R^3 form a heterocyclic ring of 5 or 6 atoms containing 2 nitrogen atoms

and 3 or 4 carbon atoms; or wherein R^3 and R^4 may be joined together to form a 5- or 6-membered ring containing one nitrogen atom, and 4 or 5 carbon atoms; and X and Y are halo or lower alkyl, such as methyl; or the pharmaceutically acceptable salts thereof.

6. A pharmaceutical composition useful in the treatment of grey matter edema comprising a pharmaceutical carrier and an effective amount of a compound of claim 1.

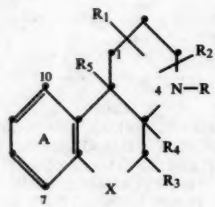
4,604,397

CERTAIN BENZO-(PYRANO AND THIOPYRANO)-PYRIDINES, USEFUL AS CNS AGENTS

Alan J. Hutchison, Verona, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 609,037, May 10, 1984, abandoned. This application Sep. 3, 1985, Ser. No. 771,934
Claims priority, application European Pat. Off., May 6, 1985, 85810208.0
Int. Cl.[4] A61K *31/38, 31/395;* C07D *491/02, 471/02*
U.S. Cl. 514—291 28 Claims

1. A compound of the formula



(I)

wherein X represents oxygen or sulfur; ring A is unsubstituted or substituted by one to three identical or different substituents selected from hydroxy, hydroxy-lower alkyl, etherified hydroxy, etherified hydroxy-lower alkyl, acyloxy, acyloxy-lower alkyl, halogen, lower alkyl, trifluoromethyl, amino, mono- and di-lower alkylamino and acylamino; or ring A is substituted by one lower alkylenedioxy; R represents hydrogen, lower alkyl or aryl-lower alkyl; R_1 represents hydrogen, lower alkyl, lower alkylthio-lower alkyl, amino, acylamino, (amino, mono- or di-lower alkylamino)-lower alkyl, carboxy, lower alkoxycarbonyl, carbamoyl or mono- or di-lower alkylcarbamoyl; R_2 to R_5 represent hydrogen or lower alkyl; and wherein within the definitions the term acyl represents lower alkanoyl, aroyl, lower alkoxycarbonyl, carbamoyl or mono- or di-lower alkylcarbamoyl; the term aryl represents phenyl or phenyl substituted by one to three of lower alkyl, lower alkoxy, halogen or trifluoromethyl; and aroyl represents benzoyl or benzenesulfonyl, benzoyl or benzenesulfonyl substituted by one to three of lower alkyl, lower alkoxy, halogen or trifluoromethyl, thienoyl, pyrroloyl, or 2-, 3- or 4-pyridylcarbonyl; a dehydro derivative thereof with a double bond at the 1,2-position, or at the 1,10b-position in which case R_5 is absent; or a pharmaceutically acceptable salt thereof.

23. A presynaptic dopamine receptor stimulating or serotonin receptor stimulating pharmaceutical composition suitable for administration to a mammal comprising an effective presynaptic dopamine receptor stimulating or serotonin receptor stimulating amount of a compound of claim 1 in combination with one or more pharmaceutically acceptable carriers.

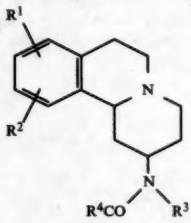
4,604,398

BENZOQUINOLIZINE DERIVATIVES, AND THEIR USE AS α_2ADRENOCEPTOR ANTAGONISTIC AGENTS

Terence J. Ward, Maidenhead, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed Jun. 13, 1985, Ser. No. 744,843
Claims priority, application United Kingdom, Jun. 28, 1984, 8416432
Int. Cl.[4] A61K *31/435;* C07D *455/06*
U.S. Cl. 514—294 6 Claims

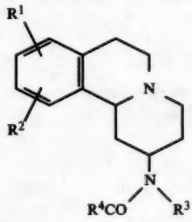
1. A compound selected from the group consisting of a benzoquinolizine of the formula



(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 which may be the same or different each represent hydrogen, lower alkyl, lower alkoxy or halogen, R^3 represents lower alkyl and R^4 is lower alkoxy or lower alkoxy carbonyl.

6. A method of antagonising α6hd 2-adrenoreceptors in warm blooded animals which comprises administering to the animal an amount sufficient to antagonise α_2-adrenoreceptors of a compound selected from the group consisting of a benzoquinolizine of the formula



(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 which may be the same or different each represent hydrogen, lower alkyl, lower alkoxy or halogen, R^3 represents lower alkyl and R^4 is lower alkoxy or lower alkoxy carbonyl.

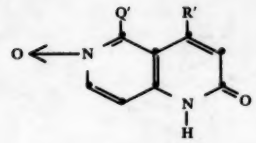
4,604,399

5-METHYL(OR ETHYL)-1,6-NAPHTHYRIDIN-2(1H)-ONE 5-OXIDES, THEIR PREPARATION AND THE CARDIOTONIC USE THEREOF

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 521,293, Aug. 8, 1983, Pat. No. 4,532,247. This application Nov. 28, 1984, Ser. No. 675,789
Int. Cl.[4] A61K *31/44;* C07D *471/04*
U.S. Cl. 514—300 7 Claims

1. A 4-R'-5-Q'-1,6-naphthyridin-2(1H)-one-6-oxide having the formula



or acid-addition salt thereof, where R' is hydrogen or methyl and Q' is methyl or ethyl.

6. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotonically effective amount of 4-R'-5-Q'-1,6-naphthyridin-2(1H)-one-6-oxide according to claim 1 or pharmaceutically acceptable acid-addition salt thereof.

4,604,400

TREATING ARTHRITIS WITH 3-(N,N-DIMETHYL CARBAMOYL)PYRAZOLO[1,5-A]PYRIDINE

Raymond F. Collins, Harold Wood; Christopher A. Ramsden, Brentwood; Libert C. Saunders, Grays, and Peter J. Warne, London, all of England, assignors to May & Baker Limited, Essex, England

Continuation of Ser. No. 504,438, Jun. 15, 1983, abandoned. This application Sep. 13, 1984, Ser. No. 649,980

Claims priority, application United Kingdom, Jun. 16, 1982, 8217485

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—300 **2 Claims**

1. A method for the treatment of a patient with an arthritic disorder which comprises administering to the patient an amount of 3-(N,N-dimethylcarbamoyl)pyrazolo[1,5-a]pyridine sufficient to ameliorate the condition of the patient.

4,604,401

ANTIBACTERIAL AGENTS III

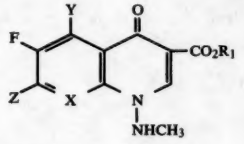
Thomas F. Mich; Townley P. Culbertson, both of Ann Arbor, and John M. Domagala, Canton, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 20, 1984, Ser. No. 633,151

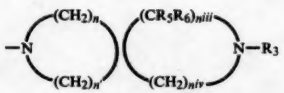
Int. Cl.[4] A61K *31/47*; C07D *215/22*

U.S. Cl. 514—312 **7 Claims**

1. A compound of the formula

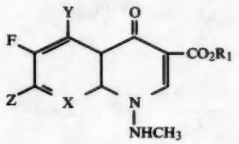


wherein Z is



wherein $R_1$is hydrogen or an alkyl having from one to six carbon atoms or a cation; X is CF or CH, Y is hydrogen or amino; R_3 is hydrogen, alkyl having from one to four carbon atoms or cycloalkyl having three to six carbon atoms; R_5 is hydrogen or alkyl having from one to three carbon atoms; R_6 is hydrogen or an alkyl having from one to three carbon atoms; n is one, two, three, or four, n' is one, two, three, or four wherein n+n' is a total of two, three, four, or five, n''' is zero, one or two, n^{iv} is one, two, or threee and the pharmaceutically accpetable acid addition or base salts thereof.

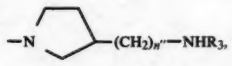
2. A compound of the formula



wherein

Y is hydrogen:

Z is



in which n'' is one and R_3 is hydrogen, methyl, ethyl, 1- or 2-propyl; X is C—F and R_1 is hydrogen or a pharmaceutically acceptable base salt thereof.

4,604,402

HYDROXY SUBSTITUTED UREIDO AMINO AND IMINO ACIDS

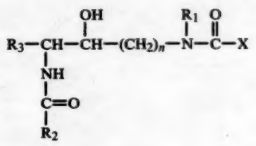
Jollie D. Godfrey, Jr., Lawrenceville; Eric M. Gordon, Pennington, and Sesha I. Natarajan, Neshanic Station, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 30, 1984, Ser. No. 595,218

Int. Cl.[4] C07D *207/04, 207/20*; A61K *31/40, 31/44*

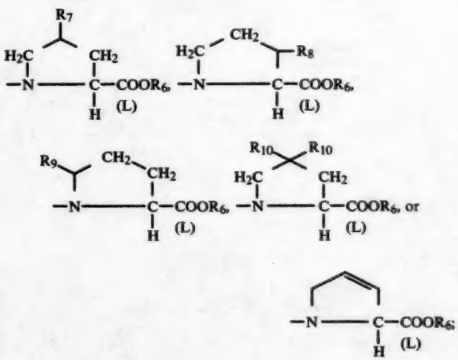
U.S. Cl. 514—333 **13 Claims**

1. A compound of the formula



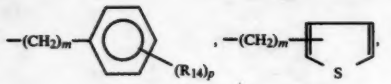
or a pharmaceutically acceptable salt thereof wherein

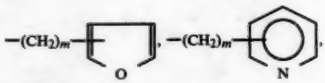
X is



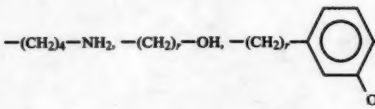
n is one or two;

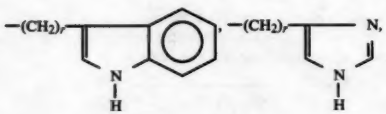
R_1 is hydrogen, lower alkyl, halo substituted lower alkyl,



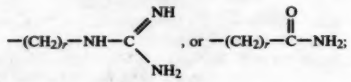


$-(CH_2)_m$—cycloalkyl, $-(CH_2)_2-NH_2$, $-(CH_2)_3-NH_2$,

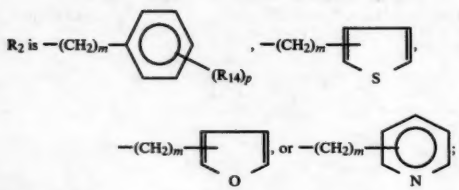




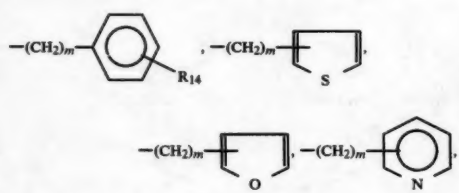
$-(CH_2)_r-SH$, $-(CH_2)_r-S-$lower alkyl,



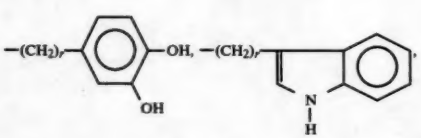
R_2 is



R_3 is hydrogen, lower alkyl,



halo substituted lower alkyl, $-(CH_2)_m$-cycloalkyl,



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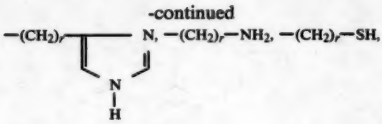
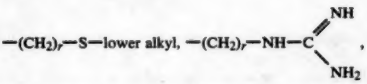
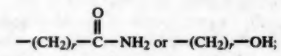
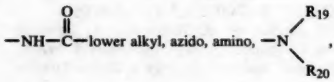


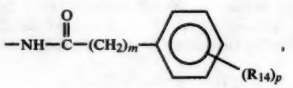


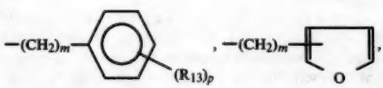


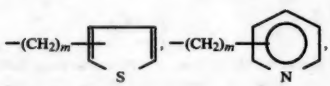
r is an integer from 1 to 4;

R_7 is hydrogen, lower alkyl, halogen, keto, hydroxy,

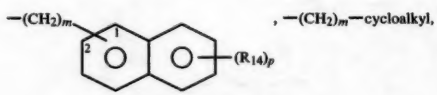


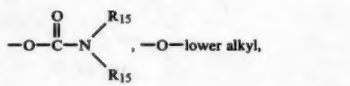


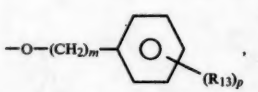




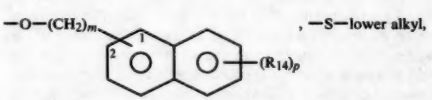
a 1- or 2-naphthyl of the formula







a 1- 2-naphthyloxy of the formula



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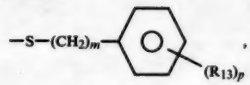
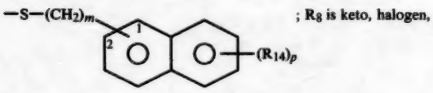
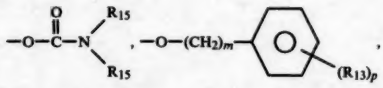


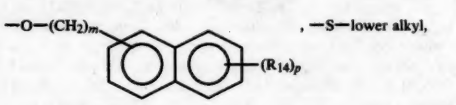
or a 1- 2-naphthylthio of the formula



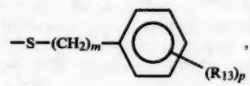
; R_8 is keto, halogen,



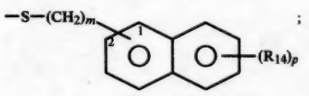
-O-lower alkyl, a 1- or 2-naphthyloxy of the formula



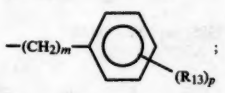
, —S—lower alkyl,



or a 1- or 2-naphthylthio of the formula



R_9 is keto or



R_{10} is halogen or —Y—R_{16};

R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

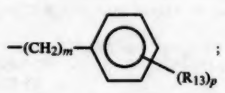
m is zero, one, two, three, or four;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

Y ix oxygen or sulfur;

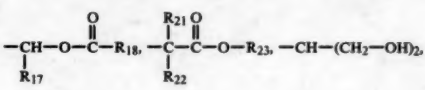
R_{16} is lower alkyl of 1 to 4 carbons, or

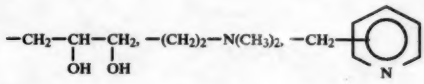


R_{19} is lower alkyl, benzyl, or phenethyl;

R_{20} is hydrogen, lower alkyl, benzyl or phenethyl;

R_6 is hydrogen, lower alkyl, benzyl, benzhydryl,





or a pharmaceutically acceptable salt forming ion;

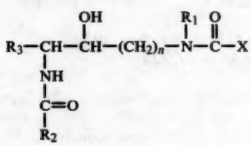
R_{17} is hydrogen, lower alkyl, cycloalkyl, or phenyl;

R_{18} is hydrogen, lower alkyl, lower alkoxy, or phenyl or R_{17} and R_{18} taken together are —$(CH_2)_2$—, —$(CH_2)_3$—, —CH=CH—, or

R_{21} and R_{22} are independently selected from hydrogen and lower alkyl; and

R_{23} is lower alkyl.

12. A pharmaceutical composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and a hypotensively effective amount of a compound of the formula



wherein n, R_1, R_2, R_3 and X are as defined in claim **1**.

13. The method of treating hypertension in a mammalian host which comprises administering a hypotensively effective amount of the composition of claim **12**.

4,604,403

USE OF SUBSTITUTED-3(2,3-DIHYDRO-1H-INDEN-5-YL)-4-HYDROXY-1H-PYRROLE-2,5-DIONES FOR TREATING GREY MATTER EDEMA

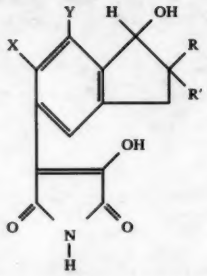
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 1, 1984, Ser. No. 605,734

Int. Cl.[4] A61K *31/40*

U.S. Cl. 514—425 **1 Claim**

1. A method of treating persons with grey matter edema which comprises administering to such a person an effective amount of a compound of the formula:



in which R and R′ are different entities and wherein:

R is C_3–C_6 cycloalkyl, C_3–C_6 cycloalkyl-lower alkyl, aryl selected from phenyl, halophenyl, methoxyphenyl, hydroxyphenyl, thienyl, aralkyl selected from benzyl and phenethyl, lower alkyl, lower alkenyl, lower alkynyl wherein the term lower indicates up to four carbon atoms;

R′ is lower alkyl, lower alkenyl, lower alkynyl; X and Y are each selected from methyl and chloro.

4,604,404

ANTIVIRAL SULFONATED NAPHTHALENE FORMALDEHYDE CONDENSATION POLYMERS

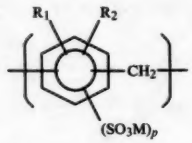
Harry R. Munson, Jr., and Robert W. Tankersley, Jr., both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

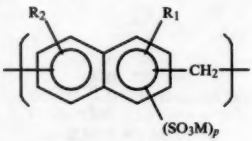
Filed Apr. 3, 1985, Ser. No. 719,296

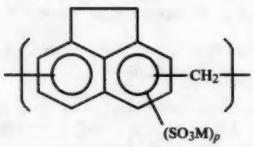
Int. Cl.[4] A61K *31/255, 31/315*

U.S. Cl. 514—494 **5 Claims**

1. A method of treating viral infections caused by Type I or Type II *Herpes simplex* viruses comprising topically administering to infected tissue of a living animal under attack by said virus an effective amount of an arylsulfonic acid polymer having a repeating unit selected from the group consisting of the following structures:







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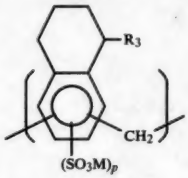
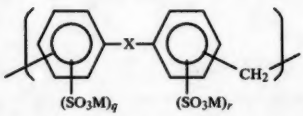




wherein R_1 and R_2 are selected from the group consisting of hydrogen, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 20 carbon atoms, fluorine, chlorine and bromine; R_3 is hydrogen, alkoxy having 1 to 20 carbon atoms; X is selected from the group consisting of a direct covalent bond between the aromatic rings, a loweralkylene having 1 to 5 carbon atoms, a lower alkylene having 2 to 5 carbon atoms, oxygen, sulfur, and $—O(CH_2)_nO—$ wherein n is an integer from 2 to 20; p is from about 0.4 to about 1.2; the sum of q and r is from about 0.8 to about 2.4; and M is selected from the group consisting of lithium, sodium, potassium, calcium, magnesium, zinc, aluminum, hydrogen, ammonium and substituted ammonium ions derived from pharmaceutically acceptable organic amines.

4,604,405

ADMIXTURES OF 2-BROMO-2-BROMOMETHYLGLUTARONITRILE AND 2,2-DIBROMO-3-NITRILOPROPIONAMIDE

John A. Jakubowski, Piscataway, N.J., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Mar. 4, 1985, Ser. No. 708,193

Int. Cl.[4] A01N *37/34*

U.S. Cl. 514—526 **8 Claims**

1. A synergistic antimicrobial admixture consisting essentially of:

(a) 2-bromo-2-bromomethylglutaronitrile and

(b) 2,2-dibromo-3-nitrilopropionamide, wherein the weight ratio of (a):(b) ranges from about 1:6 to about 5:1.

4,604,406

N-[6-METHOXY-5-(PERFLUOROALKYL)-1-NAPHTHOLYL]-N-METHYLGLYCINES AND THEIR THIONAPHTHOYL ANALOGS

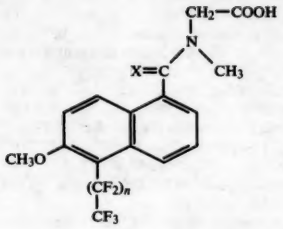
Francesco Bellini, Mt. Royal, Canada, and Kazimir Sestanj, Rocky Hill, N.J., assignors to Ayerst, McKenna & Harrison, Inc., Montreal, Canada

Filed Nov. 16, 1984, Ser. No. 672,015

Int. Cl.[4] A61K *31/19, 31/195;* **C07C** *103/84, 153/063*

U.S. Cl. 514—562 **8 Claims**

1. A compound of formula I



(I)

wherein n is an integer from 2 to 5 and X is oxygen or sulfur.

8. A method of preventing or relieving neuropathy, nephropathy, retinopathy or cataracts in a diabetic mammal by inhibiting aldose reductase, which comprises administering to said mammal an alleviating or prophylactic amount of a compound of claim 1.

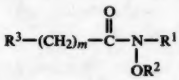
4,604,407

HYDROXAMATES

Martin F. Haslanger, Lambertville, and Donald S. Karanewsky, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 4, 1985, Ser. No. 720,102
Int. Cl.[4] A61K *31/165, 31/185;* C07C *83/10*
U.S. Cl. 514—575 13 Claims

1. A compound having the structure



wherein m is 1 to 5, R^1 is lower alkyl, phenylalkyl or phenyl, R^2 is H or lower alkyl; and R^3 is cycloalkyl, phenyl or biphenyl, all of the above hydrocarbon groups being unsubstituted.

13. A method for treating asthma in a mammalian species in need of such treatment, which comprises administering to a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,604,408

COMPOSITION FOR MAKING CELLULAR THERMOSET POLYMERIZED DICYCLOPENTADIENE POLYMER

Norman R. Newburg, deceased, late of Wilmington, Del. (by Betty Newburg, executrix), assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 526,835, Aug. 26, 1983, Pat. No. 4,535,097. This application Jun. 17, 1985, Ser. No. 745,767
Int. Cl.[4] C08J *9/14;* C08F *4/78*
U.S. Cl. 521—91 9 Claims

1. A cellular thermoset polymer product produced by the process comprising

(a) providing a polymerization mixture comprising:
dicyclopentadiene;
a catalyst; and
a blowing agent
wherein said catalyst comprises a tungsten compound selected from the group consisting of a tungsten halide and a tungsten oxyhalide;

(b) providing a heated mold;

(c) polymerizing said polymerization mixture in said mold, to form said cellular thermoset polymer product, said polymer product comprising polymerized units of dicyclopentadiene.

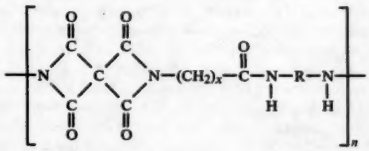
4,604,409

POLYAMIDE-IMIDE FOAMS AND METHODS OF MAKING SAME

John Gagliani, 6280 Larce Pl., San Diego, Calif. 92120, and John V. Long, 1756 E. Lexington Pl., El Cajon, Calif. 92021

Filed Jun. 13, 1985, Ser. No. 744,419
Int. Cl.[4] C08J *9/08*
U.S. Cl. 521—157 3 Claims

1. A polyamide-imide foam composition comprising a polymer having the recurring unit



wherein "n" is a positive integer, "R" is a radical selected from the group consisting of alkylene and phenylene radicals, which may have alkyl or aryl substituents and "x" is from 1 to 6.

4,604,410

MANUFACTURING OF RIGID FOAM USING ETHERIFIED MODIFIED AROMATIC POLYOLS

Milton J. Altenberg, Houston, Tex., assignor to Chardonol Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 513,502, Jul. 13, 1983. This application Nov. 5, 1984, Ser. No. 668,254
Int. Cl.[4] C08G *18/42, 18/14*
U.S. Cl. 521—172 27 Claims

1. In a method of preparing a rigid polyurethane foam composition wherein an excess of an aromatic polyisocyanate is reacted with a polyol component in the presence of a catalyst, a blowing agent and a surfactant;

the improvement for obtaining a rigid polyurethane foam having improved properties which comprises:

utilizing a polyol component comprising an etherified modified aromatic polyol, said etherified modified aromatic polyol having been prepared by:

digesting a polyalkylene terephthalate with a low molecular weight polyol selected from a group consisting essentially of ethylene glycol, propylene glycol, butylene glycol, diethylene glycol, triethylene glycol, dipropylene glycol, glycerol, and trimethyol propane with the ratio of about 0.5 to about 1 mole equivalents of polyalkylene terephthalate to about 1 to about 0.5 moles of low molecular weight polyol at a temperature of about 180° to about 250° C. to provide a digested polyol;

reacting said digested polyol with about 0.01 to about 0.7 moles of an additional low molecular weight polyol containing from about 3 to about 8 hydroxyl groups and a molecular weight from about 90 to about 350 per mole equivalent of polyalkylene terephthalate at a temperature of about 120° to about 200° C. from about 1 to about 4 hours to form an intermediate reaction product; and

alkoxylating in the presence of a basic alkoxylation catalyst said intermediate product with an alkoxylation component comprising from about 1 to about 4 mole equivalents of alkylene oxide per mole equivalent of said polyalkylene terephthalate, said alkylene oxide consisting of from 0 to about 4 moles of ethylene oxide and, correspondingly, from 4 to about 0 moles of propylene oxide with the temperature not exceeding about 200° C.

4,604,411

PROCESS FOR PREPARING STICKY POLYMERS

Akira Yada, Kusatsu; Shusaku Matsumoto, Kyoto; Yoshihiro Kawamori, Joyo; Takao Saito, Nagaokakyo; Tadashi Nishiyama, and Yoshitugu Adachi, both of Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jan. 4, 1985, Ser. No. 689,004

Claims priority, application Japan, Jan. 13, 1984, 59-5235; Jan. 19, 1984, 59-8085

Int. Cl.[4] C08F *2/46, 2/48, 2/10*

U.S. Cl. 522—14 15 Claims

1. In a process for preparing a sticky water-soluble polymer by polymerizing an aqueous solution containing at least one monomer having a polymerizable double bond to produce said sticky water-soluble polymer, the improvement which comprises carrying out the polymerization in a polymerization apparatus the portion of which contacts the monomer solution having a surface layer made of a tetrafluoroethylene-ethylene copolymer; said at least one monomer being selected from the group consisting of acrylamide, methacrylamide, an acrylic acid salt, a methacrylic acid salt, a nitrogen-containing acrylic acid ester, a diallylamine compound, a sulfoalkyl acrylate, a sulfoalkyl methacrylate, a water-insoluble acrylic acid ester, a water-insoluble methacrylic acid ester, an acrylamide alkylsulfonate, a dialkyl acrylamide, a dialkyl methacrylamide, acrylonitrile, a vinylsulfonic acid, and a vinylsulfonic acid salt and said tetrafluoroethylene-ethylene copolymer being a polymer forming a film having such an oxygen impermeability that hindrance to the polymerization of the at least one monomer on the surface layer is eliminated.

4,604,412

STABLE POLYMER EMULSION COMPOSITION CAPABLE OF GIVING A THROMBORESISTANT SURFACE, AND PROCESS FOR PRODUCTION THEREOF

Yasushi Joh, Yokohama; Toshio Nagase, Houjyoshin, and Noriaki Kaneko, Kawasaki, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

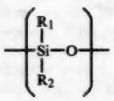
Filed Mar. 15, 1983, Ser. No. 475,499

Claims priority, application Japan, Mar. 17, 1982, 57-41865

Int. Cl.[4] C08L *83/06;* C09D *5/00;* C09K *3/00*

U.S. Cl. 523—112 33 Claims

1. A polymer emulsion composition which is stable against phase separation for extended periods and is capable of forming thromboresistant films, coatings, and surfaces, said composition comprising an emulsion of particles having an average particle diameter of from 0.1 to 50 microns of a polydiorganosiloxane having a weight average molecular weight in the range of from about 5000 to 200,000 and a hydroxyl, vinyl or acetate end group and repeating units of the formula



wherein R_1 and R_2 each independently represent an alkyl group, an aryl group, an alkenyl group or a halogenated hydrocarbon group, in a continuous phase of a solution of a polyether polyurethane or a polyester polyurethane in a cyclic either, wherein the surfaces of the polydiorganosiloxane particles are at last partially crosslinked in the presence of water, and wherein the total amount of the polyurethane and the polydiorganosiloxane is at least 4% by weight based on the weight of the composition and the amount of the polydiorganosiloxane is 0.1 to 50% by weight based on the combined weight of the polydiorganosiloxane and the polyether or polyester polyurethane.

4,604,413

RESIN COMPOSITION HAVING ELECTROMAGNETIC WAVE SHIELDING EFFECT

Takeshi Nabeta, and Isamu Hanahara, both of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 645,938, Aug. 30, 1984. This application Apr. 5, 1985, Ser. No. 720,194

Claims priority, application Japan, Sep. 7, 1983, 58-164353; Sep. 14, 1983, 58-169909; Dec. 2, 1983, 58-227019; Dec. 28, 1983, 58-247068; Mar. 10, 1984, 59-46277

Int. Cl.[4] G21F *1/10;* G21K *1/10;* C08K *5/17, 3/04*

U.S. Cl. 523—137 18 Claims

1. A resin composition having an electromagnetic wave shielding effect, comprising:

35 to 90 wt % of a copolymer of an ethylenic unsaturated nitrile, a diene rubber and an aromatic vinyl compound or a mixture of said copolymer with another copolymer of an ethylenic unsaturated nitrile and an aromatic vinyl compound;

1 to 25 wt % of a plasticizer;

5 to 40 wt % of carbon fibers, said carbon fibers being selected from the group consisting of carbonized polyacrylonitrile fibers, carbonized pitch fibers, carbonized phenolic compound fibers and mixtures thereof; and

2 to 30 wt % of carbon black.

4,604,414

ANTISTATIC ACRYLIC RESIN COMPOSITION AND METHOD FOR THE PRODUCTION THEREOF

Yasuyuki Kato; Masahiro Yuyama; Masahiko Moritani, and Mikio Futagami, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 21, 1984, Ser. No. 591,853

Claims priority, application Japan, Mar. 31, 1983, 58-57636; Mar. 31, 1983, 58-57637; Mar. 31, 1983, 58-57638; Mar. 31, 1983, 58-57639; Mar. 31, 1983, 58-57640

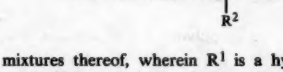
Int. Cl.[4] C08J *5/51*

U.S. Cl. 524—139 12 Claims

1. An antistatic acrylic resin composition, which comprises a copolymer of 100 parts by weight of a methyl methacrylate monomer or a monomer mixture comprising 50% by weight or more of methyl methacrylate and a copolymerizable vinyl monomer with 0.5 to 15 parts by weight of a sulphone (A) selected from the group consisting of:

[I]

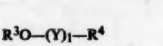
and



[II]

and mixtures thereof, wherein R^1 is a hydrocarbon group having 1 to 18 carbon atoms; a hydrocarbon group having 1 to 18 carbon atoms which is substituted with a member selected from the group consisting of hydroxy, halogen, carboxyl, tetrahydroxyfuryl, epoxy, nitrile, amide and amino, or an alkylene oxide-containing group wherein each alkylene oxide has 2 to 4 carbon atoms; R^2 is a hydrogen atom or methyl group; X is an alkylene oxide having 2 to 4 carbon atoms; n is an integer of 0 to 35 in number average; M is an alkali metal, ammonium, an organic amine base, or an organic quaternary ammonium base,

0 to 15 parts by weight of an alkylene oxide (B) of the formula:



(III)

wherein R^3 is a hydrogen atom, a hydrocarbon group having 1 to 18 carbon atoms, acryloyl group, or methacryloyl group; R^4 is a hydrogen atom, an alkyl group having 1 to 18 carbon atoms, allyl group, an aryl group having 6 to 18 carbon atoms, or an aralkyl group having 7 to 18 carbon atoms; Y is an alkylene oxide having 2 to 4 carbon atoms; and l is 1 to 35 in number average, and

0 to 5 parts by weight of an acidic phosphate (C) of the formula:

(IV)

where R^5 is an alkyl group having 1 to 18 carbon atoms, allyl group, an aryl group having 6 to 18 carbon atoms, an aralkyl group having 7 to 18 carbon atoms, an acryloxyalkyl group having 1 to 18 carbon atoms in the alkyl moiety, a methacryloxyalkyl group having 1 to 18 carbon atoms in the alkyl moiety, or a derivative thereof; q is 1 or 2.

4,604,415

THERMOPLASTIC MOLDING MATERIALS

Juergen Hambrecht, Heidelberg; Karl-Heinz Illers, Otterstadt; Adolf Echte, and Johann Swoboda, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,083

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346302

Int. Cl.[4] C08K *5/51;* **C08L** *71/04*

U.S. Cl. 524—140 **7 Claims**

1. A thermoplastic molding material which contains a mixture of

(I) from 95 to 50% by weight of a polyphenylene ether and

(II) from 5 to 50% by weight of a copolymer consisting of

(A_1) from 74 to 99 parts by weight of a monovinylaromatic monomer,

(A_2) from 1 to 26 parts by weight of an alkyl acrylate where alkyl is of not more than 8 carbon atoms, and

(III) from 0 to 20 parts by weight of a diene elastomer component which has a glass transition temperature of $\leqq 0°$ C., the sum of the number of parts by weight of said elastomer when totaled with those of A_1 and A_2 being 100.

6. A thermoplastic molding material according to claim 1, wherein said elastomer component III consists of from 10 to 50 parts by weight of a graft copolymer as a grafted shell on 50 to 90 parts by weight of an elastomeric grafting base.

4,604,416

METHACRYLIC RESIN COMPOSITION

Yoshio Nakai, Iwakuni; Katsusuke Yamauchi, Yamato; Masaaki Kishimura, Iwakuni, and Masamitsu Tateyama, Yamaguchi, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Dec. 13, 1984, Ser. No. 681,125

Claims priority, application Japan, Dec. 13, 1983, 58-233704; Jun. 2, 1984, 59-112222

Int. Cl.[4] C08K *5/06, 5/52;* **C08L** *33/12*

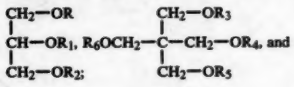
U.S. Cl. 524—145 **12 Claims**

1. A methacrylic resin composition comprising:

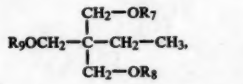
(I) 50 to 99.8% by weight, based on the total weight of the methacrylic resin composition, of a methacrylic resin comprising 80% to 100% by weight of methyl methacrylate units and 20% to 0% by weight of units of another monomer copolymerizable with methyl methacrylate,

(II) 0.1 to 40% by weight, based on the total weight of the methacrylic resin composition, of a rubbery component which is a multi-stage, sequentially produced polymer containing an elastomeric portion comprising at least 50% by weight of units of a monomer selected from the group consisting of 1,3-butadiene and an acrylic acid ester, and

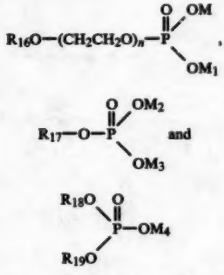
(III) 0.1 to 10% by weight, based on the total weight of the methacrylic resin composition of at least one compound selected from the group consisting of ester compounds of polyhydroxy alcohols and aliphatic acids represented by the following formulae:



and



wherein R, R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 independently represent hydrogen or an acyl group of 8 to 20 carbon atoms, and phosphate compounds represented by the following formulae:



wherein R_{16}, R_{17}, R_{18}, and R_{19} independently represent an alkyl group having 8 to 20 carbon atoms; M, M_1, M_2, M_3, and M_4 independently represent hydrogen, Na, K or Li; and n is a number of from 1 to 50.

4,604,417

POLYMERIZABLE THIOESTER SYNERGISTS

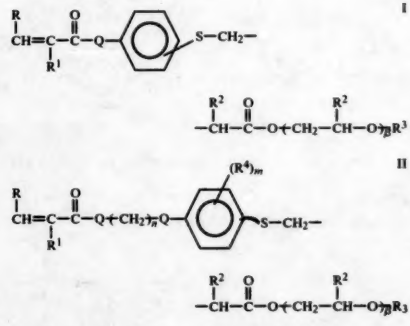
Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 10, 1984, Ser. No. 680,011

Int. Cl.[4] C08K *5/36;* **C08F** *236/14, 222/24, 222/38;* **C07C** *149/437, 149/41, 149/40, 149/273*

U.S. Cl. 524—199 **8 Claims**

1. A composition comprising: (1) an oxidizable diene containing polymer; (2) a phenolic or amine antidegradant in physical admixture with the oxidizable organic material; and (3) a synergist in physical admixture with the oxidizable organic material, the improvement comprising at least one synergist selected from the group of compounds having the structural formulae I–XII:



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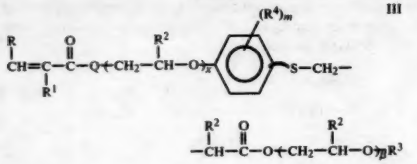
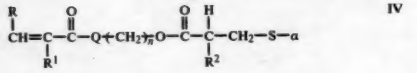
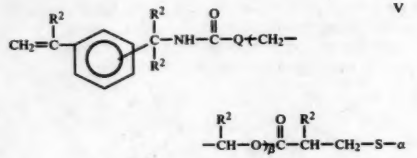
III



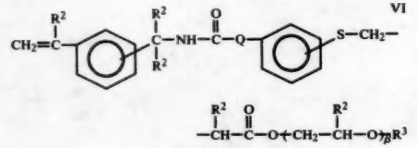
IV



V



VI



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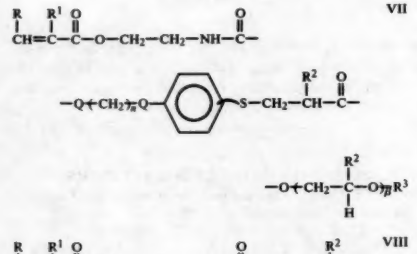

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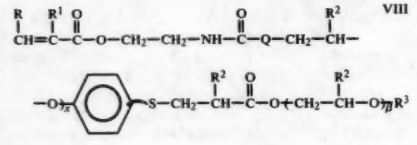

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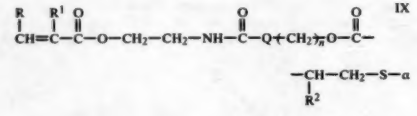

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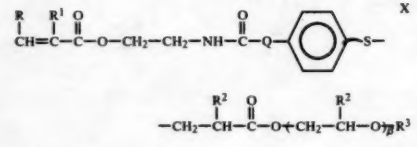

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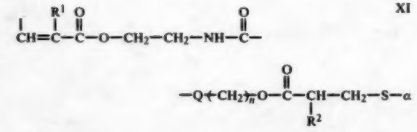

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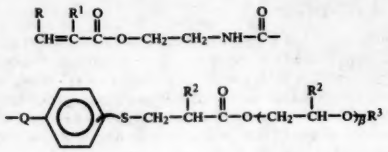


wherein

R is selected from hydrogen, methyl or phenyl radicals;

R^1 is selected from hydrogen, methyl or ethyl radicals;

R^2 is selected from hydrogen or methyl radicals;

R^3 is selected from hydrogen, alkyl radicals of 1 to 12 carbon atoms, phenyl and substituted phenyl radicals;

R^4 is an alkyl radical of 1 to 3 carbon atoms;

Q may be the same or different divalent radical selected from —O— or —NH—;

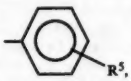
β is 0 or a whole number from 1 to 20;

n is a whole number from 2 to 20;

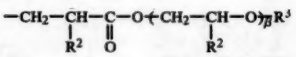
m is 0 or 1 or 2;

x is a whole number from 1 to 20;

α is a monovalent radical selected from alkyl radicals of 1 to 30 carbon atoms, the radical



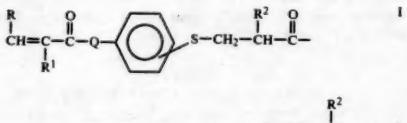
or the radical



wherein R^2, R^3 and β are defined as above and R^5 is selected from hydrogen, hydroxyl and alkyl radicals of 1 to 10 carbon atoms.

8. A composition of matter represented by structural formulae I–X:

I



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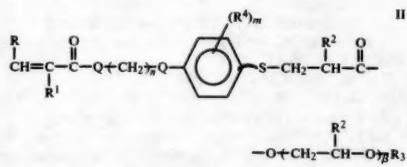

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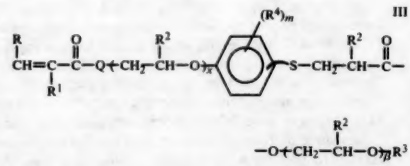

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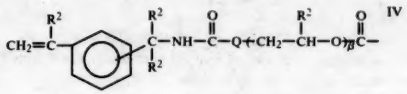

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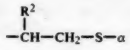

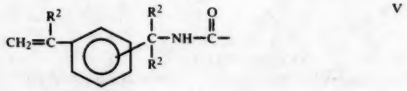

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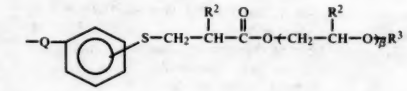

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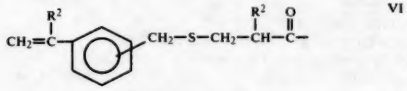

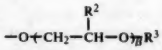

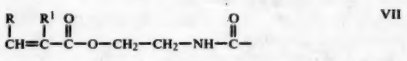

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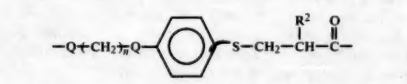

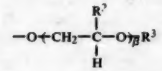

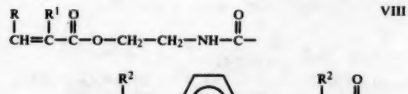

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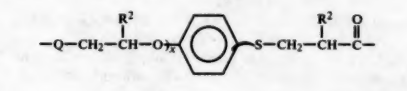
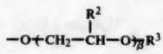
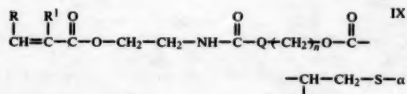
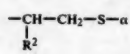
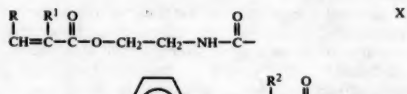






IX





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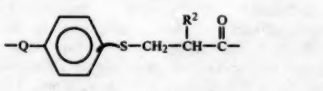
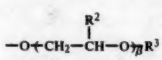




wherein

R is selected from hydrogen, methyl or phenyl radicals;

R^1 is selected from hydrogen, methyl or ethyl radicals;

R^2 is selected from hydrogen or methyl radicals;

R^3 is selected from hydrogen, alkyl radicals of 1 to 12 carbon atoms, phenyl and substituted phenyl radicals;

R^4 is an alkyl radical of 1 to 3 carbon atoms;

Q may be the same or different divalent radical selected from —O— or —NH—;

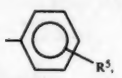
β is 0 or a whole number from 1 to 20;

n is a whole number from 2 to 20;

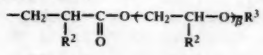
m is 0 or 1 or 2;

x is a whole number from 1 to 20;

α is a monovalent radical selected from alkyl radicals of 1 to 30 carbon atoms, the radical



or the radical



wherein R^2, R^3 and β are defined as above and R^5 is selected from hydrogen, hydroxyl and alkyl radicals of 1 to 10 carbon atoms.

4,604,418

PROCESS FOR ISOCYANURATING HEXAMETHYLENE-DIISOCYANATE USING A SODIUM OR POTASSIUM CARBOXYLATE CATALYST AND A PAINT COMPOSITION COMPRISING THE PRODUCT OF SAID PROCESS AND POLYOLS

Masanori Shindo, Fujisawa; Yusuke Aoki, Yokohama; Yosizumi Kataoka, Ota-ku; Susumu Enomoto, Yokohama, and Minoru Nakamura, both of Yokohama, all of Japan, assignors to Nippon Polyurethane Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 380,885, May 21, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,119

Claims priority, application Japan, Mar. 19, 1982, 57-43864

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—296 **23 Claims**

1. A process for preparing an isocyanurated compound of hexamethylene diisocyanate which comprises the following steps:

(a) partially polyoling hexamethylene diisocyanate using a polyol compound in an amount less than 15 mol %, and then recovering unreacted hexamethylene diisocyanate from the reaction mixture,

(b) trimerising said polyoled hexamethylene diisocyanate in the presence of a catalyst having the formula (I),

$$C_nH_{2n+1}COOM \quad (I)$$

wherein n stands for an integer of 2 to 10, C_nH_{2n+1} for a straight or branched alkyl radical and M for a potassium or sodium metal, and

(c) stopping the trimerization reaction at a reaction ratio of less than 80%.

4,604,419

TREATMENT OF AQUEOUS SUSPENSIONS OF VINYL CHLORIDE POLYMERS

Peter V. Smallwood, Cheshire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Mar. 26, 1985, Ser. No. 716,138

Claims priority, application United Kingdom, Apr. 17, 1984, 8409962; Sep. 26, 1984, 8424353

Int. Cl.[4] C08K *5/10*

U.S. Cl. 524—318 **12 Claims**

1. Method of treating an aqueous suspension of a vinyl chloride polymer, produced by aqueous suspension polymerisation

and containing residual vinyl chloride monomer, to inhibit wet-foaming therein, which method comprises adding to said aqueous suspension of a vinyl chloride polymer containing residual vinyl chloride monomer, a glyceride of a saturated or unsaturated carboxylic acid, containing 6 to 20 carbon atoms.

4,604,420

VULCANIZABLE POLYMER COMPOSITIONS WITH IMPROVED SCORCH

Kyosaku Sato, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Mar. 22, 1985, Ser. No. 714,919

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.[4] C08F 8/42

U.S. Cl. 524—394 **16 Claims**

1. A vulcanizable polymer composition with improved scorch comprising (1) a carboxylated styrene-butadiene rubber, said rubber being a copolymer of butadiene, styrene, and one or more α-β unsaturated carboxylic acids selected from acrylic, methacrylic, fumaric, maleic and itaconic acids, (2) one or more polyvalent metal oxides, and (3) one or more alkali metal salts selected from the lithium sodium and potassium salts of C_{12-18}-alkanoic acids.

4,604,421

POLYPROPYLENE RESIN COMPOSITION COMPRISING TALC HAVING SPECIFIED AVERAGE DIAMETER AND PARTICLE SIZE

Tatsuyuki Mitsuno; Teruhisa Koyama, and Yuji Ikezawa, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 26, 1985, Ser. No. 716,300

Claims priority, application Japan, Mar. 27, 1984, 59-60263

Int. Cl.[4] C08K 3/34; C08L 23/00, 53/00

U.S. Cl. 524—449 **4 Claims**

1. A polypropylene resin composition comprising 50 to 97% by weight of a crystalline propylene-ethylene copolymer resin having a melt index within the range of 0.1 to 100, 0 to 20% by weight of a rubber material, and 3 to 50% by weight of mica having an average particle diameter determined by photo extinction and sedimentation method of 0.5 to 4.5μ and a particle size distribution of 95% or more by weight for 10μ or less, 60% or more by weight for 5μ or less, and 10 to 80% by weight for 1μ or less.

4,604,422

FLAME-RETARDANT MOLDED COMPOSITION INCORPORATING A POLY[N-(BROMOPHENYL)MALEIMIDE-CO-STYRENE-CO-MALEIC ANHYDRIDE] COPOLYMER

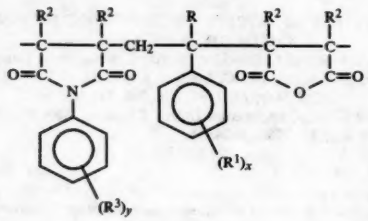
Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 24, 1984, Ser. No. 685,361

Int. Cl.[4] C08L 39/04

U.S. Cl. 524—502 **4 Claims**

1. A moldable composition comprising a random copolymer comprised of the following recurring units:



wherein R represents —H, —CH_3, or —CH_2CH_3; R^1 represents —CH_3, —CH_2CH_3, —$CH(CH_3)_2$, —$C(CH_3)_3$, —OH, —OCH_3, —CO_2H, —$CONH_2$, or —$CON(CH_3)_2$; each R^2 separately represents —H or —CH_3; R^3 represents a —Cl or —Br; x represents an integer of from 0 to 3 and, y represents an integer of from 1 to 3; a flame-retardant synergist; and, a thermoplastic resin with the proviso that the random copolymer and the thermoplastic resin cannot be the same.

4,604,423

COMPOSITION

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 563,183, Dec. 19, 1983, Pat. No. 4,536,538. This application Nov. 19, 1984, Ser. No. 672,718

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.[4] C08L 69/00

U.S. Cl. 524—508 **18 Claims**

1. A composition comprising

a. a major amount of an aromatic polycarbonate;

b. a minor amount of an impact modifier comprising

(i) an amorphous polyester comprising units derived from 1,4-cyclohexane dimethanol and aromatic dicarboxylic acid or ester forming derivative; and

(ii) an olefin acrylate polymeric resin;

the components (i) and (ii) in such quantities that said composition has the following properties

(a) thick section notched Izod impact resistance or ductility at break higher than a,

(b) double gate Izod impact or ductility at break of a weld line higher than a+b(i) or a+b(ii); and

(c) higher resistance against basic organic solution as measured by notched Izod impact resistance or ductility at break in thin section than a+b(i); and

(d) a flexural property and heat strength improving quantity of glass fiber which additionally maintains the ductility of (a) and (b) under notched Izod impact testing before and after aging in a basic organic solution.

4,604,424

THERMALLY CONDUCTIVE POLYORGANOSILOXANE ELASTOMER COMPOSITION

Richard L. Cole, Bay City, and Gloria Janik, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 29, 1986, Ser. No. 823,851

Int. Cl.[4] C08L 83/04

U.S. Cl. 524—862 **25 Claims**

1. A one-part polyorganosiloxane composition curable to a thermally conductive silicone elastomer, said composition comprising:

A. 100 parts by weight of a liquid polydiorganosiloxane containing an average of two ethylenically unsaturated hydrocarbon radicals per molecule;

B. a curing agent in an amount sufficient to cure said polydiorganosiloxane, where said curing agent is an organosilicon compound containing an average of at least three silicon-bonded hydrogen atoms per molecule and no more than one of said hydrogen atoms per silicon atom;

C. a platinum-containing hydrosilation catalyst in an amount sufficient to promote curing of said polydiorganosiloxane;

D. from 200 to 400 parts by weight of a finely divided thermally conductive filler comprising from 50 to 90 percent by weight of zinc oxide and from 10 to 50 percent by weight of magnesium oxide; and

E. an amount of filler treating agent sufficient to maintain the processability of said composition.

4,604,425

METHOD FOR MODIFYING THE SURFACE OF POLYMER MATERIALS

Hiroshi Ohmura; Yoshihiro Oshibe, both of Aichi; Masaharu Nakayama, Nagoya, and Takashi Yamamoto, Yokohama, all of Japan, assignors to Nippon Oil and Fats Co., Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,577
Claims priority, application Japan, Apr. 30, 1983, 58-74959
Int. Cl.[4] C08L *9/00, 31/00, 53/00*
U.S. Cl. 525—88 6 Claims

1. A method for modifying the surface of a polymer material, comprising adding a block copolymer consisting of a polymer portion compatible with the polymer material and a hydrophilic polymer portion to the polymer material,

said block copolymer having been produced through the following first and second steps,

in the first step, either a vinyl monomer which forms a hydrophilic polymer, or a vinyl monomer which forms a polymer compatible with the polymer material, is polymerized in the presence of a polymeric peroxide as a polymerization initiator to produce a peroxy bond- or azo bond-containing polymer, and

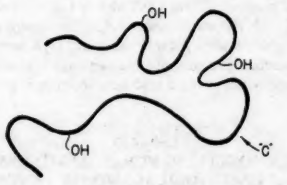
in the second step, either a vinyl monomer which forms a hydrophilic polymer, or a vinyl monomer which forms a polymer compatible with the polymer material, both the vinyl monomers being used in such a manner that, when a hydrophilic polymer is produced in the first step, a vinyl monomer which forms a polymer compatible with the polymer material is used in the second step, and when a polymer compatible with the polymer material is produced in the first step, a vinyl monomer which forms a hydrophilic polymer is used in the second step, is polymerized in the presence of a polymerization initiator of the peroxy bond- or azo bond-containing polymer obtained in the first step.

4,604,426

BETTER FOAMABLE STYRENE AND OTHER OLEFIN POLYMER COMPOSITIONS

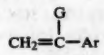
Louis C. Rubens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 256,758, Apr. 23, 1981. This application Oct. 24, 1983, Ser. No. 545,316
Int. Cl.[4] C08G *18/62;* C08F *8/30;* C08L *75/00*
U.S. Cl. 525—123 13 Claims



1. A lightly cross-linked polymeric composition comprising, in intimate admixture:

(a) as a fundamental constituent, a hydroxylated, normally solid, linear polymer selected from the group consisting of linear olefin polymers and linear alkenyl aromatic polymers, which is a polymerizate containing at least about 60 percent by weight, based on total polymer weight (i.e., "weight percent") of at least one polymerizable monomer of the general Formula:



wherein: G is selected from the group consisting of hydrogen and methyl; and Ar is an aromatic radical, including alkyl and halo-ring-substituted aromatic units, that contains from 6 to about 10 carbon atoms; with the balance being copolymerized units of another addition polymerizable monomer or monomer mixture that is copolymerizable with styrene, the polymer having a hydroxyl functionality of from 2 to 6 average hydroxyl groups per unit weight average molecule; and

(b) a substantially minor proportion of an inter-reactive crosslinking polyisocyanate constituent, with the further limitation that the polymer have a crosslinking coefficient of from about 0.8 to about 3 which results in a visually detectable gel in a solvent which dissolves the corresponding noncrosslinked hydroxylated polymers, and that such composition on incorporation of a blowing agent therein is foamable to a thermal collapse resistant thermoplastic foam.

4,604,427

METHOD OF FORMING ELECTRICALLY CONDUCTIVE POLYMER BLENDS

William P. Roberts, Columbia, and Leslie A. Schulz, Olney, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 685,887, Dec. 24, 1984, abandoned. This application Jul. 19, 1985, Ser. No. 756,534
Int. Cl.[4] C08L *79/04*
U.S. Cl. 525—185 7 Claims

1. A method of imparting electrical conductivity to the surface layer, up to 1 mm deep, of non-porous polymers by impregnation with a conductive polymer, said method comprising:

(a) either diffusing a cyclic monomer selected from the group consisting of pyrrole, aniline and substituted analogs thereof into said non-porous polymer or codissolving said cyclic monomer and said non-porous polymer in a solvent therefor followed by evaporation of said solvent, and

(b) then exposing the impregnated polymer to a solution containing at least one chemical oxidant selected from the group consisting of trivalent iron compounds, tetravalent cerium compounds, hexavalent molybdenum, tungsten or chromium compounds, divalent copper compounds, monovalent silver compounds, nitrites, quinones, peroxides and peracids, said oxidant(s) being capable of reacting with the cyclic monomer to convert it to an electrically conductive polymeric oxidation product within the surface layer of the impregnated polymer.

4,604,428

METHOD OF PRODUCING A FLAME-RETARDANT ACRYLIC POLYMER

Masaaki Fujimatsu, and Toshiyuki Kobashi, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Jan. 6, 1984, Ser. No. 568,922
Claims priority, application Japan, Jan. 10, 1983, 58-2596
Int. Cl.[4] C08F *259/04, 259/06, 259/08*
U.S. Cl. 525—276 5 Claims

1. A method of producing a flame-retardant acrylic polymer, which comprises polymerizing, at a temperature of 30° to 60° C., a vinyl monomer containing more than 75 weight % of acrylonitrile, in an aqueous medium containing 0.01 to 2.0 weight %, based on the vinyl monomer, of an inorganic salt, and also containing a radical initiator and a halogen-containing polymer latex substantially free from an emulsifier, said polymer latex containing polymer particles of less than 0.5μ stably dispersed therein, wherein the quantity of the halogen-containing polymer latex is such that the quantity of the halogen-containing polymer in the latex is 1.5 to 150 weight % based on the weight of the vinyl monomer

4,604,429

AMMONIUM SALTS OF POLYMERIC ACIDS, THEIR PREPARATION AND USE AS FUNGICIDES

Eberhard Ammermann; Ernst Buschmann, both of Ludwigshafen; Gregor Ley, Wattenheim, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,699

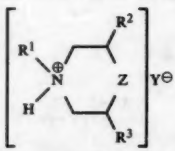
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341829

Int. Cl.[4] C08F *30/00, 130/08, 230/08*

U.S. Cl. 525—326.6 3 Claims

1. An ammonium salt of a polymeric acid of the formula

(I)



where R^1 is alkyl, cycloalkyl, cycloalkylalkyl or aralkyl, R^1 having 12–14 carbon atoms, R^2 and R^3 are each hydrogen, OH, CH_2OH or C_1–C_3-alkyl, Z is CH_2, O S, CO, or $(CH_2)_2$ and Y is an anion of a copolymeric acid based on acrylic acid, methacrylic acid, maleic acid, maleic anhydride, vinylsulfonic acid, styrenesulfonic acid, allysulfonic acid, methallylsulfonic acid, acrylamido-2-methylpropanesulfonic acid, vinylphosphonic acid and their salts, or mixtures thereof, and another monomeric compound selected from the group consisting of vinyl acetate, vinyl propionate, vinyl chloride, acrolein, methacrolein, acrylonitrile, methacrylonitrile, (meth)acrylamide and its derivatives, and malonates, fumarates and (meth)acrylates, said copolymeric acid having a K-value of from 10–50.

4,604,430

NOVEL BILE SEQUESTRANT RESIN

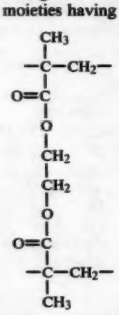
Porter C. Johnson, Pasadena, Calif., assignor to Bristol-Myers Company, New York, N.Y.

Filed May 11, 1984, Ser. No. 609,408

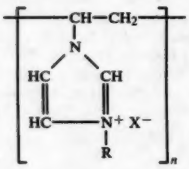
Int. Cl.[4] C08F *220/20, 226/06*

U.S. Cl. 525—326.7 11 Claims

1. A quaternized vinylimidazole-ethylene glycol dimethacrylate copolymer consisting of from about 1% to about 25%, based on the molecular weight of the copolymer, of ethylene glycol dimethacrylate moieties having the structural formula



and the balance to 100% based on the molecular weight of the copolymer of polyvinylimidazolium moieties having the structural formula



wherein n, on average, ranges from 3 to about 40 and wherein R is selected from the group consisting of alkyl and alkenyl groups having from 1 to 18 carbon atoms and $—CH_2R^1$ wherein R^1 is selected from the group consisting of phenyl, $—CH_2OH$, $—CH_2NHCOC_6H_5$, and $—CH_2NR^2R^3$ wherein R^2 and R^3 are each selected from the group consisting of methyl and ethyl and wherein X^- is a pharmaceutically acceptable anion selected from the group consisting of halides, acetate, propionate and phosphate.

4,604,431

CHEMICAL MODIFICATION OF (METH)ACRYLIC ACID HOMOPOLYMERS AND ALKYL (METH)ACRYLATE POLYMERS IN AQUEOUS SYSTEMS WITH AMINO SULFONIC ACIDS

Dodd W. Fong; Claudia C. Pierce, both of Naperville, and David A. Grattan, Lagrange Highlands, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 22, 1985, Ser. No. 800,833

Int. Cl.[4] C08F *8/36*

U.S. Cl. 525—351 5 Claims

1. A method of preparing copolymers of acrylamido sulfonic acids which comprises converting to acrylamido sulfonic groups at least 5 mole % of the acrylic acid or methacrylic acid groups in a polymer which contains at least 5 mole % of these monomers in its structure which comprises reacting an aqueous solution of the acrylic acid or methacrylic acid polymer with an amino sulfonic acid from the group consisting of the lower alkyl, aryl and aryalkyl sulfonic acids, under pressure at a temperature of at least 70° C. for a period of time sufficient to convert at least 5 mole % of the acrylic acid or methacrylic acid groups in the polymer to amido lower alkyl, aryl or arylalkyl sulfonic acid groups.

4,604,432

FURAN REIMPREGNATION RESIN

P. Anthony Hinman, Torrance, Calif., assignor to Hitco, Newport Beach, Calif.

Division of Ser. No. 479,926, Mar. 29, 1983, Pat. No. 4,540,764. This application Jun. 24, 1985, Ser. No. 747,711

Int. Cl.[4] C08G *79/00*

U.S. Cl. 525—389 12 Claims

1. The copolymer obtained by copolymerizing furfuryl alcohol, a polyester prepolymer prepared by reacting an ethylenically unsaturated dicarbocyclic acid or anhydride with a glycol or a mixture of furfuryl alcohol and said polyester prepolymer with the thermoplastic/thermosetting product of (1) 2-furanacrylic acid or 2-furoic acid and (2) a metal complex which is a reaction product of tungsten carbonyl with pyrrolidine, said copolymer being a multi-cycle reimpregnation polymer.

4,604,433

THERMOSETTING FURAN BASED RESIN CONTAINING NIOBIUM AND/OR TANTALUM

Paul V. Mosher, Torrance, Calif., assignor to Hitco, Newport Beach, Calif.

Filed Jul. 6, 1984, Ser. No. 628,658

Int. Cl.[4] C08G *79/00*

U.S. Cl. 525—411 9 Claims

1. A thermosetting furan based resin containing niobium, tantalum, or a mixture of niobium and tantalum chemically bonded in the backbone of the polymer.

4,604,434

AROMATIC POLYCARBONATE CROSSLINKED WITH AROMATIC BIS CYCLIC CARBONATE

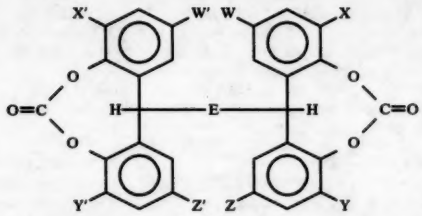
Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jan. 2, 1985, Ser. No. 688,244

Int. Cl.[4] C08G *63/76, 63/62*

U.S. Cl. 525—462 7 Claims

1. A composition comprising an aromatic polycarbonate crosslinked with a residue of a compound of the formula



wherein X, Y, X' and Y' are the same or different and are hydrogen or alkyl of one to about six carbon atoms, inclusive; W, W', Z and Z' are the same or different and are alkyl of one to about six carbon atoms, inclusive, and E is alkylene or alkylidene of two to about twelve carbon atoms, inclusive.

4,604,435

THERMOSETTING EPOXY RESIN COMPOSITIONS

Taro Koshii, Chiba; Yoshitsugu Morita, Ichihara; Hideo Shinmi, Ichihara, and Tsuneo Hanada, Ichihara, all of Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 672,052

Claims priority, application Japan, Nov. 28, 1983, 58-223855

Int. Cl.[4] C08L *63/00;* **H01B** *3/40;* **C08G** *59/40;* **C09J** *3/16*

U.S. Cl. 525—476 **6 Claims**

1. A thermosetting epoxy resin composition comprising a mixture of

(a) 100 parts by weight of epoxy resin;

(b) 1 to 100 parts by weight of a curing agent for the epoxy resin composition;

(c) 1 to 100 parts by weight of an organopolysiloxane composition which is a block copolymer containing at least one linear polysiloxane block and at least one resinous polysiloxane block wherein there is present in the block copolymer (i) 10 to 90 weight percent of linear organopolysiloxane blocks having the unit formula $—R_2SiO—_n$ and (ii) 90 to 10 weight percent of resinous organopolysiloxane blocks, the weight percents being based on the total weight of (i) and (ii) in the block copolymer, wherein R is independently selected from substituted and unsubstituted monovalent hydrocarbon groups having from 1 to 8 carbon atoms; n is an integer with a value of about 10 to 100; the solvent solution viscosity of the block copolymer being at least 30 centipoise at 25° C. for a 40 weight percent solution: the parts of (b) and (c) being based on 100 parts of (a).

4,604,436

PROCESS FOR METAL MODIFIED PHENOLIC NOVOLAC RESIN

Donald H. Thorpe, Williamsville, and Raymond P. Knipple, North Tonawanda, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 47,836, Jun. 12, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 132,739

Int. Cl.[4] C08G *8/32, 8/36;* **C08L** *61/14*

U.S. Cl. 525—504 **43 Claims**

1. In the process of preparing a metal-modified novolac phenolic resin wherein the metal is selected from the group consisting of copper, aluminum, zinc, chromium, indium, tin, cadmium, cobalt and nickel, by reaction of a compound of said metal, an ammonia base and a novolac phenolic resin at an elevated temperature sufficient to maintain the reaction mixture in molten condition, the improvement comprising charging as reactants an oxide of the metal or the functional equivalent of said oxide, a mono-carboxylic acid selected from the group consisting of C_{1-12} alkanoic acids and aromatic carboxylic acids of the benzene or naphthalene series, an ammonia base and the novolac phenolic resin.

4,604,437

POLYMER FROM SUBSTITUTED, UNSATURATED, BICYCLIC IMIDE

Alfred Renner, Muntelier, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

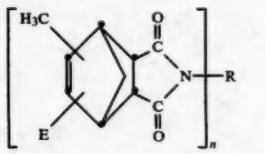
Filed Jan. 22, 1985, Ser. No. 693,640

Claims priority, application Switzerland, Jan. 31, 1984, 450/84; Oct. 5, 1984, 4796/84

Int. Cl.[4] C08F *122/40*

U.S. Cl. 526—262 **15 Claims**

1. A polymer obtained by heating an imide of formula I



(I)

in which E is allyl or methallyl and n is 1 or 2 and, when n is 1, R is hydrogen, alkyl having 1–12 C atoms, alkenyl having 3–6 C atoms, cycloalkyl having 5–8 C atoms, aryl having 6–10 C atoms or benzyl, or when n is 2, R is $—C_mH_{2m}—$ in which m is 2–20, arylene having 6–10 C atoms or a group of the formula II

(II)

in which T is methylene, isopropylidene, CO, O, S or SO_2, at a temperature between 180° and 300° C. for 6 to 60 hours.

4,604,438

HIGH TEMPERATURE THERMOSET TERPOLYMERS

Allyson J. Beuhler, Indian Head Park, and James A. Wrezel, Buffalo Grove, both of Ill., assignors to UOP Inc., Des Plains, Ill.

Filed Aug. 12, 1985, Ser. No. 764,816

Int. Cl.[4] C08F *20/32*

U.S. Cl. 526—262 **26 Claims**

1. A thermoset terpolymer comprising a cross-linked mixture of

(a) an alpha-substituted olefin selected from the group consisting of styrene, o-chlorostyrene, p-chlorostyrene, o-bromostyrene, p-bromostyrene, o-iodostyrene, m-iodostyrene, p-iodostyrene and vinylnaphthylene;

(b) an alpha, beta-disubstituted olefin selected from the group consisting of acenaphthylene, indene and N-phenylmaleimide; and

(c) a dual function monomer selected from the group consisting of glycidyl acrylate and glycidyl methacrylate.

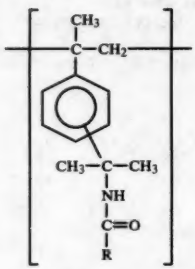
4,604,439

FUNCTIONALIZED MONOMERS FROM 1-(1-ISOCYANATO-1-METHYLETHYL)-3- OR 4-(1-METHYLETHENYL) BENZENE

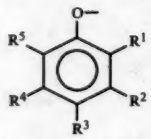
Howard A. Colvin; Kirkwood S. Cottman, both of Akron, and Dane K. Parker, Massillon, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 28, 1985, Ser. No. 737,742
Int. Cl.[4] C08F *26/02, 126/02, 226/02*
U.S. Cl. 526—288 4 Claims

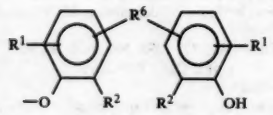
1. A polymer consisting essentially of segmeric units, a portion of said units consisting of at least one segmeric unit having the structural formula:



wherein R is a monovalent radical selected from the group of compounds of the structural formula:



wherein R^1 is hydrogen or an alkyl radical of 1 to 4 carbon atoms, a cycloalkyl radical of 5 to 12 carbon atoms, or an aralkyl radical having 7 to 12 carbon atoms, R^2 and R^5 are hydrogen, and R^3 and R^4 are alkyl radicals having 1 to 12 carbon atoms, cycloalkyl radicals having 5 to 12 carbon atoms, aralkyl radicals having 7 to 12 carbon atoms, or hydrogen; or a monovalent radical of the formula:



wherein R^6 is an alkylidine radical having 1 to 4 carbon atoms, the group —O—, or the group —S—, and wherein R^1 is hydrogen and R^2 is an alkyl radical having 1 to 4 carbon atoms, cycloalkyl radicals having 5 to 12 carbon atoms, or aralkyl radicals having 7 to 12 carbon atoms; with the proviso that the polymer also contains at least one segmeric unit selected from the group consisting of: segmers of styrene, butadiene, α-methylstyrene, acrylonitrile, butylacrylate, vinyl toluene and isoprene.

4,604,440

HYDROPHILIC THREE DIMENSIONAL POLYMER AND A METHOD FOR PRODUCTION THEREOF

Otto Wichterle; Jiri Trekoval; Jiri Vacik, and Jiri Michálek, all of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie VED, Prague, Czechoslovakia

Filed Apr. 2, 1985, Ser. No. 718,957
Claims priority, application Czechoslovakia, Apr. 6, 1984, 2633-84
Int. Cl.[4] C08F *220/40*
U.S. Cl. 526—327 16 Claims

1. A method for preparing a hydrophilic three dimensional polymer having a prevailing mass comprising structural units which correspond to monomers miscible with water at any ratio, comprising reacting, in the presence of a free-radical initiator,

(a) one part by weight of a monomer miscible with water, and

(b) 0.01 to 1 part by weight of a polyfunctional unsaturated oligomer having an average degree of polymerization x=3 to x=100, said oligomer prepared by the anionic polymerization of

(i) a member selected from the group consisting of methacrylonitrile, methacrylic ester of univalent saturated alcohols containing 1 to 4 carbon atoms, and methacrylic esters of monohydroxy compounds containing at least one etheric oxygen atom in the chain, and

(ii) allyl methacrylate.

4,604,441

POLYPROPYLENE SHEET

Ryuhei Ueeda, Kurashiki; Kiyonobu Fujii, Okayama, and Hiroshi Narukawa, Soja, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Mar. 20, 1985, Ser. No. 713,829
Claims priority, application Japan, Mar. 29, 1984, 59-62447
Int. Cl.[4] C08F *10/06*
U.S. Cl. 526—351 19 Claims

1. A polypropylene sheet having a thickness of at least 200 μm characterized in (a) that the base material is a propylene-based polymer having a melt flow rate of not more than 5 and a propylene unit content of not less than 70% by weight, (b) that the maximum value (Ftmax) among the values (Ft's) of integration of the force parallel to the sheet plane, as appearing upon heating said sheet at a temperature above the melting point thereof over the time period during which said force is observed, falls within the range of 0.5–45 kg.minute/cm^2, (c) that the ratio (RFt) between Ft's measured in directions at right angles to each other on the sheet plane is not more than 10, and (d) that the melting point (Tms) of said sheet is higher than the melting point (Tmr) of said sheet as measured after melting followed by recrystallization in the unstrained condition, the melting point difference (ΔTms=Tms−Tmr) being at least 3° C.

4,604,442

ORGANOPOLYSILOXANE-POLYAMIDE BLOCK POLYMERS AND METHOD FOR MAKING

Jonathan D. Rich, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1985, Ser. No. 718,038
Int. Cl.[4] C08G *77/04*
U.S. Cl. 528—28 8 Claims

1. A method for making organopolysiloxane-polyamide block polymers which comprises

(1) effecting reaction under interfacial polymerization conditions between an aqueous solution of an organo diamine or organo silicon diamine and an organic solvent solution of a poly(diorganosiloxane) having an average of about 7 to 2000 chemically combined diorganosiloxy units and terminal groups of the formula

or a mixture of such polydiorganosiloxane and organic polyacidhalide, where the reaction is conducted in the presence of a basic intercondensation catalyst and the polydiorganosiloxane is the reaction product of the corresponding silanol terminated polydiorganosiloxane and halosilylaroylhalide, and

(2) recovering organopolysiloxane block polymer from the resulting organic phase, where R is a member selected from the class consisting of halogen, $C_{(1-13)}$ monovalent hydrocarbon radicals, substituted $C_{(1-13)}$ monovalent hydrocarbon radicals and mixtures thereof, R^1 is selected from divalent $C_{(6-13)}$ aromatic organic radicals, and X is a halogen radical.

4,604,443

PARTIAL HYDROLYZATES CONTAINING HYDROLYZABLE MOIETIES FROM ORGANOSILANE COMPOUNDS

Wen-Hsuan Chang, Gibsonia, and Edward L. Dufford, Sarver, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 30, 1985, Ser. No. 728,968
Int. Cl.[4] C08G 77/04
U.S. Cl. 528—28 25 Claims

1. An ungelled partial hydrolysis product of an organosilicon-containing material, said organosilicon-containing material comprising greater than or equal to 10 mole percent of at least one organosilane compound corresponding to the formula R—Si—Y_3 in which R represents hydrogen, or a C_1–C_{10} group joined to Si through an Si—C linkage, and each Y independently represents an easily hydrolyzable group, wherein said partial hydrolysis product is prepared by hydrolyzing said easily hydrolyzable groups of said organosilane compound with water wherein the amount of water is determined according to the following formula

$$(E_{1,2}\times 0.5)+(E_{3,4}\times Z)=W,$$

wherein

W represents the total moles H20 employed calculated on total equivalents of said easily hydrolyzable groups given that one equivalent of said easily hydrolyzable groups corresponds to 1 mole of said easily hydrolyzable groups employed,

$E_{1,2}$ represents the total number of equivalents of Y employed from organosilane compounds containing one or two Y groups,

$E_{3,4}$ represents the total number of equivalents of Y employed from organosilane compounds containing three or four Y groups,

Z is a number in the range of from 0.023 to 0.43;

provided that said organosilicon-containing material has an average functionality of equal to or greater than 2.4 based on easily hydrolyzable Y groups attached to silicon atoms of organosilane compounds containing easily hydrolyzable Y groups present in said organosilicon-containing material but excluding easily hydrolyzable Y groups attached to silicon atoms of organosilane compounds having only 1 easily hydrolyzable Y group which may be present in said organosilicon-containing material.

4,604,444

CURABLE ORGANOPOLYSILOXANE COMPOSITIONS COMPRISING MICROENCAPSULATED HARDENING ACCELERATORS

André Donnadieu, Lyons, and Michel Letoffé, Sainte Foy les Lyon, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Oct. 19, 1984, Ser. No. 662,518
Claims priority, application France, Oct. 19, 1983, 83 16614
Int. Cl.[4] C08G 77/04
U.S. Cl. 528—34 13 Claims

1. A composition of matter comprising (A) 100 parts by weight of an α,ω-di(hydroxy)diorganopolysiloxane polymer having a viscosity of from 700 to 1,000,000 mPa.s at 25° C., which comprises diorganosiloxy recurring units of the formula R_2SiO, in which the symbols R, which may be identical or different, represent hydrocarbon radicals having from 1 to 8 carbon atoms, or substituted such hydrocarbon radicals bearing at least one halogen atom or cyano substituent, (B) 2 to 20 parts by weight of a cross-linking agent of the general formula:

$$R_pSi(OCOR')_{4-p},$$

in which the symbol R is as defined above, the symbol R' represents a hydrocarbon radical devoid of aliphatic unsaturation and having from 1 to 15 carbon atoms and the symbol p represents zero or one, (C) 0.01 to 7 parts by weight, per 100 parts by weight of (A)+(B)+(C), of hardening accelerator therefor, said accelerator containing and/or generating water by chemical reaction when said accelerator is placed in contact with the polyacyloxysilane (B), and said accelerator being protectively microencapsulated within impermeable outer skin membranes adopted to be disrupted by thermal, irradiation or mechanical treatment to permit the release of said accelerator (C) therefrom and consequent curing of said composition.

4,604,445

POLYURETHANE PREPOLYMER COMPRISING THE REACTION PRODUCT OF AT LEAST TWO ACTIVE HYDROGEN CONTAINING SUBSTANCES WITH POLYISOCYANATE

Edward L. Kay, Akron, and Kenneth B. Roskos, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Co., Akron, Ohio

Filed Apr. 18, 1985, Ser. No. 724,693
Int. Cl.[4] C08G 18/12
U.S. Cl. 528—64 18 Claims

1. A urethane prepolymer comprising:

the reaction product of a polyisocyanate and an effective amount of at least two low molecular weight polymers each having two or more end groups selected from the group consisting of hydroxyl, amine, or combinations thereof, said polymers having a low molecular weight of from about 100 to about 10,000, said polyisocyanate having the formula $R(N{=}C{=}O)_n$ where R is an aliphatic having from 2 to 20 carbon atoms, a cycloaliphatic having from 4 to 20 carbon atoms, an aromatic or aliphatic substituted aromatic having from 6 to about 20 carbon atoms, or combinations thereof, the urethane prepolymer having an improved low strain modulus and an improved tensile strength upon cure.

4,604,446

BONDING COMPOSITIONS AND SHAPED ARTICLES UTILIZING THE BONDING COMPOSITIONS

I. Daniel Sand, Jonesborough; Freddie A. Shepherd, and David R. Fagerburg, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1984, Ser. No. 686,508
Int. Cl.[4] C08G 63/18
U.S. Cl. 528—173 1 Claim

1. A copolyesterether containing repeating units from

(a) about 90–100 mole % 1.4-cyclohexanedicarboxylic acid which is at least 80% trans configuration;
(b) about 1–10 mole % of at least one difunctional sulfomonomer containing at least one metal sulfonate group attached to an aromatic nucleus wherein the functional groups are carboxyl, hydroxy or amino;
(c) about 3–12 mole % of poly(tetramethylene oxide) glycol;
(d) about 15–20 mole % 1.4-butanediol or about 45–65 mole % 1.4cyclohexanedimethanol; and
(e) ethylene glycol in an amount sufficient to bring the total of the glycol components to 100 mole %.

4,604,447

HALOGEN-FREE, HIGH FLASH POINT REACTANT SOLUTION

Gerald D. Malpass, Jr., Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 22, 1983, Ser. No. 554,468
Int. Cl.[4] C08F *4/52*
U.S. Cl. 526—189 **22 Claims**

1. A halogen-free polymerization reactant solution useful in metathesis-catalysis comprising dicyclopentadiene; trialkyl aluminum, where each alkyl contains from 5 to 10 carbon atoms and where the trialkyl aluminum is present in a dicyclopentadiene to trialkyl aluminum molar ratio of about 80:1 to about 1300:1; and bis(2-methoxyethyl)ether, where the bis(2-methoxyethyl)ether is present in a trialkyl aluminum to bis(2-methoxyethyl)ether ratio of at least 1:0.5, said reactant solution having a flash point greater than 100° F.

4,604,448

MOULDING COMPOSITIONS FROM MELAMINE-FORMALDEHYDE RESOLES

Robert Farkas, Bishops Stortford, and Lothar M. Hohmann, London, both of England, assignors to Polymer Tectonics, Limited, London, England

PCT No. PCT/GB84/00247, § 371 Date Mar. 11, 1985, § 102(e) Date Mar. 11, 1985, PCT Pub. No. WO85/00374, PCT Pub. Date Jan. 31, 1985
PCT Filed Jul. 10, 1984, Ser. No. 711,568
Claims priority, application United Kingdom, Jul. 14, 1983, 8319106
Int. Cl.[4] C08G *12/32*; C08L *61/24, 61/28*
U.S. Cl. 528—232 **23 Claims**

1. A moulding composition comprising (i) a melamine-formaldehyde resole in which the mole ratio melamine:formaldehyde is in the range 1:1.1 to 1:5.0, and (ii) a glycol in an amount between 20 and 80% by weight, based on the weight of solid melamine-formaldehyde resole.

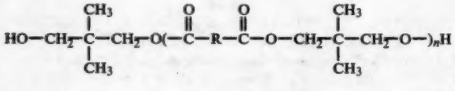
4,604,449

PROCESS FOR PREPARING POLY(ESTER-AMIDES)

Winston J. Jackson, Jr., and Herbert F. Kuhfuss, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 9, 1985, Ser. No. 785,647
Int. Cl.[4] C08G *63/44, 69/44*
U.S. Cl. 528—288 **4 Claims**

1. A process for preparing poly(ester-amides) which comprises reacting in molten form a compound of the formula



wherein n is 1–200 and R is divalent alicyclic radical having 4 to 20 carbon atoms, a divalent aliphatic radical having 4 to 20 carbon atoms or a divalent aromatic radical having 6 to 16 carbon atoms with the carbonyl linkages separated by at least 3 carbon atoms, with (a) about 5–50 mol % of a diamine of the formula

$$NH_2—CH_2—R^1—CH_2—NH_2$$

wherein R^1 is a divalent alicyclic radical having 4 to 20 carbon atoms, a divalent aliphatic radical having 0 to 20 carbon atoms or a divalent aromatic radical having 6 to 16 carbon atoms or (b) about 5–80 mol % of an aliphatic or cycloaliphatic amino alcohol having 4–20 carbon atoms to form a high melt viscosity polymer having an I.V. of at least 0.4.

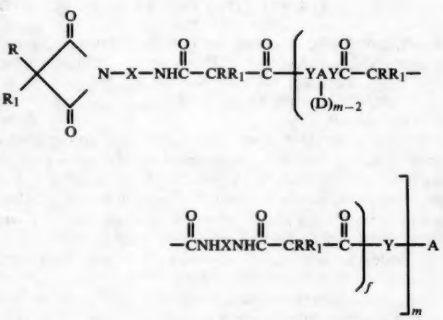
4,604,450

POLYMER FROM AZETIDINE-2,4-DIONE AND POLYOL OR POLYAMINE

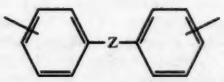
Shenghong A. Dai, Wallingford; Steven J. Grossman, Cheshire, and Kemal Onder, North Haven, all of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 608,004, May 7, 1984, Pat. No. 4,550,157. This application Aug. 16, 1985, Ser. No. 766,221
Int. Cl.[4] C08G *69/00*
U.S. Cl. 528—322 **16 Claims**

1. An azetidine-2,4-dione prepolymer having the formula



wherein A is the residue of a polymeric polyol or polyamine having a molecular weight of from about 400 to about 8000 and a functionality m of from about 2 to about 6, Y represents —O— when said A is the residue of a polymeric polyol and —NH— when said A is the residue of a polymeric polyamine, f has an average value between 0 and 1, D represents a branch unit when the functionality of said polymeric polyol or polyamine is greater than 2, R and R_1 when taken separately are independently selected from the group consisting of hydrogen and hydrocarbyl, and when R and R_1 are taken together with the carbon atom to which they are joined represent a cycloalkane having 4 to 8 ring carbon atoms, inclusive, and X is selected from the group consisting of lower alkylene, cycloalkylene, arylene, and divalent radicals having the formula



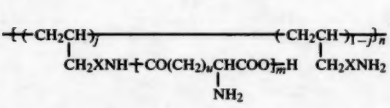
wherein Z is selected from the group consisting of —CO—, —O—, —SO_2—, and alkylene having 1 to 4 carbon atoms, inclusive.

4,604,451
NOVEL FUNCTIONALIZED RESIN DERIVED FROM POLYALLYLAMINE

Susumu Harada; Kiyoshi Shimizu, and Masayuki Ujiie, all of Koriyama, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

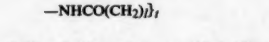
Filed Nov. 13, 1984, Ser. No. 670,545
Claims priority, application Japan, Nov. 15, 1983, 58-214777
Int. Cl.[4] C08F *8/30*
U.S. Cl. 525—328.2 **4 Claims**

1. A functionalized resin represented by the general formula:



[I]

wherein, X represents the general formula



[II]

t is 0 or 1, l is an integer of 1 to 20, $n \geqq 10$, $0 < j < 1$, u=1 or 2, and m=0 or 1, with the proviso that t and m are not simultaneously 0.

4,604,452
METAL CARBOXYLATE/ALKYLPHENOL CURING CATALYST FOR POLYCYANATE ESTERS OF POLYHYDRIC PHENOLS

David A. Shimp, Prospect, Ky., assignor to Celanese Corporation, New York, N.Y.

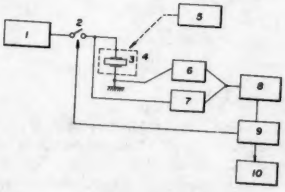
Filed Oct. 21, 1985, Ser. No. 789,678
Int. Cl.[4] C08G *73/00*
U.S. Cl. 528—422 **27 Claims**

1. A curable composition comprising a polycyanate ester of a polyhydric phenol and a catalyst comprising a liquid solution of a metal carboxylate in an alkylphenol wherein the metal is a coordinating transition metal having 9 or more electrons in its next-to-outermost shell, wherein the carboxylate contains 4 to about 24 carbon atoms and wherein the alkylphenol has 1 or 2 alkyl substituents ortho or para to the phenol group and wherein the alkyl groups contain a total of 4 to about 24 carbon atoms.

4,604,453
POLYESTER COMPOSITION

Katsuaki Kuze; Yuziro Matsuyama; Yoshio Yamaoka; Ryuichi Murashige, all of Otsu, and Osamu Makimura, Ohgaki, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1985, Ser. No. 714,996
Claims priority, application Japan, Mar. 22, 1984, 59-055836; Apr. 27, 1984, 59-087057; Jun. 13, 1984, 59-121525; Feb. 15, 1985, 60-028898
Int. Cl.[4] C08G *63/70*
U.S. Cl. 528—481 **15 Claims**



1. A polyester having an initial accumulation electric charge of not less than 2.9 $\mu c/mm^2$ when determined in a melt state according to the method comprising the following steps:

placing a polyester sample between two parallel electrodes separated by a distance of 1 cm, said two electrodes being maintained at 275° C. in a constant temperature chamber;

applying a voltage of 1200 V to said sample from a voltage source through a switch circuit which is opened or closed depending on a signal from a data treating device for a period of three minutes;

detecting resultant voltage and current values;

plotting the variation of the current value as a function of time on a graph;

calculating from the region (a) as shown in FIG. 2 the area bordered by the abscissa time value of 0.5 seconds and the abcissa time value corresponding to the initial current value to obtain an area value;

dividing said area value by the area of said electrodes to obtain the value of the initial accumulation electric charge.

2. The polyester according to claim 1, which has a heat resistance of not more than 0.210 when determined according to the method comprising the steps of:

admitting said polyester into a region having a nitrogen pressure of 100 mmHg;

sealing said region;

heating said polyester at 300° C. for two hours under a nitrogen pressure of 100 mmHg; and

measuring the change in intrinsic viscosity between the intrinsic viscosity at 30° C. and 300° C. to obtain the heat resistance value.

4,604,454
METHOD OF RECOVERING VINYL CHLORIDE RESIN

Masaaki Nishina, Takaoka; Shiro Imaizumi, Yokohama, and Osamu Ozaki, Himi, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,118
Claims priority, application Japan, Oct. 28, 1983, 58-202025
Int. Cl.[4] C08F *6/24;* B07B *1/04*
U.S. Cl. 528—491 **7 Claims**

1. A method of recovering a vinyl chloride resin in the form of granules having good flow characteristics and suitable for use in paste processing, said method comprising the steps of

mixing an aqueous dispersion containing 10–70% by weight of a vinyl chloride resin at a temperature of 20° to 70° C. with from 0.5 to 30 parts by weight, per 100 parts by weight of the vinyl chloride resin in the aqueous dispersion, of an organic liquid which is difficultly soluble in water and does not dissolve nor swell the vinyl chloride resin to form a granular aggregate of the vinyl chloride resin,

classifying the granular aggregate by passing the granular aggregate through a sieve to thereby adjust the particle size of the granular aggregate to contain not more than 20% by weight of particles having a particle diameter of not more than 100 microns, and

dehydrating and drying the particle size-adjusted granular aggregate to thereby recover said vinyl chloride resin as an easily dispersible, non-agglomerating mass of granules having good flowability.

4,604,455
PROCESS OF PREPARING AZOALKANE MIXTURE CONTAINING AT LEAST ONE UNSYMMETRICAL AZOALKANE

Ronald E. MacLeay, Erie, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 14, 1984, Ser. No. 681,731
Int. Cl.[4] C07C *107/02*
U.S. Cl. 534—587 **8 Claims**

1. A process of preparing a mixture of azoalkanes comprising reacting 4 equivalents of a mixture of at least two amines

having the structures R'—NH_2 and R—NH_2 wherein R and R' are different and independently selected from the group consisting of a straight chain or branched alkyl of 1 to 22 carbons, a cycloalkyl of 3 to 12 carbons, and an aralkyl of 7 to 11 carbons, with the proviso that there can not be two aralkyl groups on the same azoalkane, with 1 equivalent of sulfuryl chloride in an anhydrous inert solvent until the reaction is completed, and then oxidizing the mixture of sulfamide products with basic bleach after removing the amine hydrochloride side products with an aqueous wash to form the mixture product of at least two azoalkanes, at least one of which is unsymmetrical of the structure R—N=N—R' and at least one other is symmetrical of the structure R'—N=N—R' or R—N=N—R', with the further proviso that in the oxidation of the more difficult to oxidize sulfamides, the solvent content is reduced to a minimal amount prior to the addition of the oxidizing solution or during the oxidation reaction.

4,604,456

CEPHEM AND CEPHAM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Kiyoshi Tsuji, Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

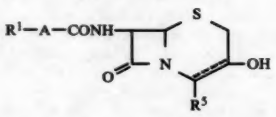
Division of Ser. No. 886,340, Mar. 14, 1978, Pat. No. 4,425,341. This application Oct. 19, 1983, Ser. No. 543,297

Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Oct. 11, 1977, 42315/77; Jan. 3, 1978, 75/78

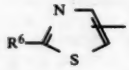
Int. Cl.[4] C07D *501/22*; A61K *31/545*

U.S. Cl. 540—222 **16 Claims**

1. A compound of the formula



wherein R^1 is thiadiazolyl, thiazolyl of the formula:



in which R^6 is amino or protected amino, A is a group of the formula:

in which

R^2 is alkyl which may be substituted with halogen, carboxy or esterified carboxy,

R^5 is carboxy or functionally modified carboxy, and the dotted line represents 3-cephem and cepham nuclei, inclusively,

and pharmaceutically acceptable salt thereof.

4,604,457

2-SUBSTITUTED CEPHEM DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Shigeru Torii; Hideo Tanaka; Junzo Nogami, all of Okayama; Michio Sasaoka, Tokushima; Norio Saito, Tokushima, and Takashi Shiroi, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP83/00299, § 371 Date May 8, 1984, § 102(e) Date May 8, 1984, PCT Pub. No. WO84/00965, PCT Pub. Date Mar. 15, 1984

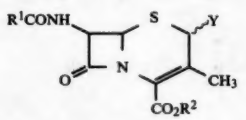
PCT Filed Sep. 6, 1983, Ser. No. 614,162

Claims priority, application Japan, Sep. 9, 1982, 57-157581

Int. Cl.[4] C07D *501/22*

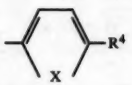
U.S. Cl. 540—223 **3 Claims**

1. A compound represented by the formula:



(II)

wherein R^1 represents phenyl; phenyl substituted with lower alkyl, lower alkoxy, halogen or nitro; phenylmethyl; phenylmethyl substituted with lower alkyl, lower alkoxy, halogen or nitro on the benzene nucleus; phenoxymethyl; or phenoxymethyl substituted with lower alkyl, lower alkoxy, halogen or nitro on the benzene nucleus: R^2 represents hydrogen atom or protective group for carboxylic acid: and Y represents carboxyalkylthio group or group of the formula:



wherein R^4 represents hydrogen atom or lower alkyl group and X represents —O—, —S— or >N—CH_3.

4,604,458

3-SUBSTITUTED CARBONYLOXY-7-DISUBSTITUTED AMINO-10-SUBSTITUTED CARBONYLPHENOTHIAZINES

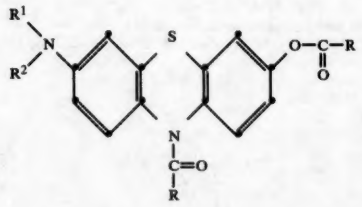
William M. Hung, Cincinnati, Ohio, assignor to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 636,464, Jul. 31, 1984, Pat. No. 4,551,740. This application Sep. 3, 1985, Ser. No. 771,875

Int. Cl.[4] C07D *265/28*

U.S. Cl. 544—37 **6 Claims**

1. A compound having the structural formula



wherein:

R represents non-tertiary C_1 to C_{12} alkyl, C_4 to C_8 cycloalkyl, non-tertiary C_1 to C_{12} alkyl substituted with halogen, non-tertiary C_1 to C_4 alkoxy or non-tertiary C_1 to C_4 alkoxycarbonyl, phenyl or phenyl substituted by one to three of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro, halo, phenyl or cyano; and

R^1 and R^2 independently represent non-tertiary C_1 to C_4 alkyl, phenyl, phenyl substituted by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy, benzyl or benzyl substituted in the benzene ring by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy.

4,604,459
TRIPHENDIOXAZINE REACTIVE DYESTUFFS

Horst Jäger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

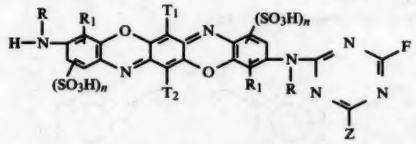
Filed Jun. 6, 1985, Ser. No. 741,769

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423581

Int. Cl.[4] C09B *19/00, 19/02*

U.S. Cl. 544—76 **3 Claims**

1. A dyestuff of the formula



wherein

R=H or C_1–C_4-alkyl,

R_1=H, CH_3, C_2H_5, Cl, OCH_3, OC_2H_5 or COOH,

T_1, T_2=H, Cl, Br, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl or phenoxy,

Z=optionally substituted amino group,

n=0, 1 or 2.

4,604,460
1-OXADETHIACEPHAM COMPOUNDS

Mitsuru Yoshioka; Uyeo Shoichiro, both of Toyonaka; Yoshio Hamashima, Kyoto; Ikuo Kikkawa, Takarazuka; Teruji Tsuji, Takatsuki, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

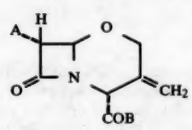
Division of Ser. No. 374,862, May 4, 1982, Pat. No. 4,443,598, which is a continuation-in-part of Ser. No. 322,662, Nov. 18, 1981, Pat. No. 4,366,316, which is a continuation of Ser. No. 72,600, Sep. 5, 1979, abandoned, which is a continuation of Ser. No. 877,811, Feb. 14, 1978, abandoned. This application Oct. 17, 1983, Ser. No. 542,520

Claims priority, application Japan, Feb. 15, 1977, 52-15813; Jun. 6, 1977, 52-67025; Oct. 1, 1980, 55-138092

Int. Cl.[4] C07D *498/04*

U.S. Cl. 544—90 **2 Claims**

1. A compound of the formula:



wherein

A is benzoylamino, methylbenzoylamino, chlorobenzoylamino, nitrobenzoylamino, or cyanobenzoylamino, and

B is hydroxy, benzyloxy, tolylmethoxy, chlorobenzyloxy, diphenylmethoxy, naphthylmethoxy, t-butoxy, or trimethylsilyloxy.

4,604,461
5-SUBSTITUTED-9-DISUBSTITUTED AMINO-12-SUBSTITUTED CARBONYLBENZO[A]PHENOXAZINES

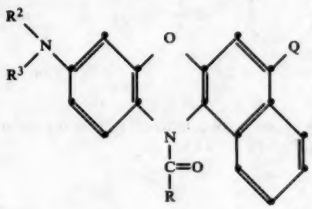
William M. Hung, Cincinnati, Ohio, assignor to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 636,461, Jul. 31, 1984, Pat. No. 4,570,171. This application Sep. 3, 1985, Ser. No. 772,096

Int. Cl.[4] C07D *265/28*

U.S. Cl. 544—99 **8 Claims**

1. A compound having the structural formula



wherein:

Q represents [N-R^1-N-(RCO)amino] or (RCOO);

R represents non-tertiary C_1 to C_{12} alkyl, C_4 to C_8 cycloalkyl, non-tertiary C_1 to C_{12} alkyl substituted with halogen, phenyl or phenyl substituted by one to three of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro, halo, phenyl, cyano, or trihalomethyl; and

R^1, R^2 and R^3 independently represent non-tertiary C_1 to C_4 alkyl, phenyl, phenyl substituted by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy, benzyl or benzyl substituted in the benzene ring by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy.

4,604,462
4-SUBSTITUTED AMIDO-8-DISUBSTITUTED AMINOIMIDAZOPHENOXAZINES

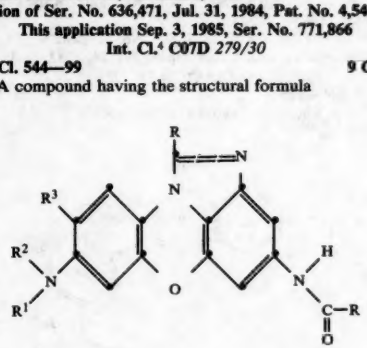
William M. Hung, Cincinnati, Ohio, assignor to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 636,471, Jul. 31, 1984, Pat. No. 4,549,192. This application Sep. 3, 1985, Ser. No. 771,866

Int. Cl.[4] C07D *279/30*

U.S. Cl. 544—99 **9 Claims**

1. A compound having the structural formula



wherein:

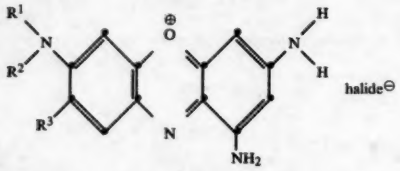
R represents non-tertiary C_1 to C_{12} alkyl, C_4 to C_8 cycloalkyl, non-tertiary C_1 to C_{12} alkyl substituted with halogen, non-tertiary C_1 to C_4 alkoxy or non-tertiary C_1 to C_4 alkoxycarbonyl, phenyl or phenyl substituted by one to three of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro, halo, phenyl, cyano, or trihalomethyl;

R^1 and R^2 independently represent non-tertiary C_1 to C_4 alkyl, phenyl, phenyl substituted by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4

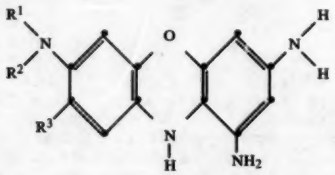
alkoxy, benzyl or benzyl substituted in the benzene ring by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy; and

R^3 represents hydrogen or non-tertiary C_1 to C_4 alkyl.

7. A process for preparing a compound according to claim 1 which comprises in a first step, interacting a compound having the structural formula



with a reducing agent to obtain the corresponding leuco compound having the structural formula



and, in a second step, interacting the leuco compound with at least two molecular equivalents of an acylating agent having the structural formula R-CO-Z in which Z represents halo or RCOO, and R, R^1, R^2 and R^3 have the same respective meanings given in claim 1.

4,604,463

CAMPTOTHECIN DERIVATIVES AND PROCESS FOR PREPARING SAME

Tadashi Miyasaka, Kanagawa; Seigo Sawada, Tokyo; Kenichiro Nokata, Tokyo; Eiichi Sugino, Tokyo, and Masahiko Mutai, Tokyo, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

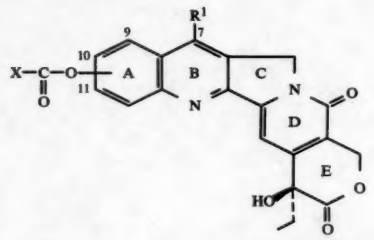
Filed Jul. 5, 1984, Ser. No. 627,980

Claims priority, application Japan, Jul. 14, 1983, 58-126946

Int. Cl.[4] C07D *491/22*

U.S. Cl. 544—125 **25 Claims**

1. Camptothecin derivatives of the formula:



wherein R^1 is a hydrogen atom, a halogen atom or an alkyl group with 1–4 carbon atoms and X is a chlorine atom or $—NR^2R^3$ where R^2 and R^3 are the same or different and each represents a hydrogen atom, a substituted or unsubstituted alkyl group with 1–4 carbon atoms or a substituted or unsubstituted group selected from the group consisting of cyclopentyl, cyclohexyl, N-methylpiperidyl-(4), 2-pyrrolidyl, phenyl, tolyl, xylyl, pyridyl-2 and 2-methylpyridyl-(4), with the proviso that when both R^2 and R^3 are the substituted or unsubstituted alkyl groups, they may be combined together with the nitrogen atom, to which they are bonded, to form a heterocyclic ring selected from the group consisting of pyrrolidine, piperidine, 2-oxapyrrolidine, morpholine, thiomorpholine and 4-R^4 piperizine rings in which R^4 is a hydrogen atom, a substituted or unsubstitued alkyl group with 1–4 carbon atoms or a substituted or unsubstituted phenyl group and wherein the grouping —O—CO—X is bonded to a carbon atom located in any of the 9-, 10- and 11-positions in the ring A, and ammonium salts or alkali metal salts thereof.

4,604,464

IMMUNOMODULATORY 3-(SUBSTITUTED AMINOBENZOYL)-3,4-DIHYDROPHTHALAZIN-1(2H)-ONES

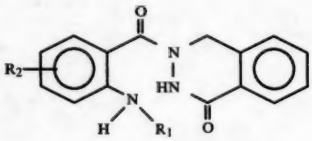
Robert J. Murray, Penfield, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 1, 1984, Ser. No. 636,633

Int. Cl.[4] C07D *237/30*

U.S. Cl. 544—237 **14 Claims**

1. A compound of the formula



wherein

R_1 is H, C_1–C_4 lower alkyl, C_3–C_7 cycloalkyl, C_6–C_{14} aryl, benzyl, or C_6–C_{14} aryl monosubstituted with or disubstituted with either methyl or trifluoromethyl, and

R_2 is H, C_1–C_4 lower alkyl, C_1–C_8 alkoxy, OH, NH_2 or NO_2.

4,604,465

HALOGUANIDINE INTERMEDIATES

Tobias O. Yellin, Wallingford, Pa.; Philip N. Edwards, Bramhall, and Michael S. Large, Congleton, both of England, assignors to ICI Americas, Inc., Wilmington, Del. and Imperial Chemical Industries, Limited, Welwyn Garden City, England

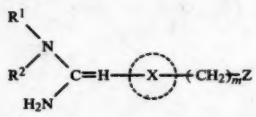
Division of Ser. No. 206,005, Nov. 12, 1980, Pat. No. 4,362,728. This application Sep. 21, 1982, Ser. No. 420,863

Claims priority, application United Kingdom, Nov. 13, 1979, 7939232; Apr. 18, 1980, 8012789; Aug. 13, 1980, 8026420

Int. Cl.[4] C07D *239/42*; A61K *31/505*

U.S. Cl. 544—326 **5 Claims**

1. A guanidine derivative of the formula:



in which

R^1 and R^2, which may be the same or different, are hydrogen atoms or branched or unbranched alkyl radicals of 1 to 10 carbon atoms, cycloalkyl radicals of 3 to 8 carbon atoms or cycloalkylalkyl radicals in which the alkyl part is of 1 to 6 carbon atoms and the cycloalkyl part is of 3 to 8 carbon atoms, each of the alkyl, cycloalkyl and cycloalkylalkyl radicals being optionally substituted by one or more halogen atoms selected from fluorine, chlorine and bromine atoms, provided that at least one of R^1 and R^2 is a halogen substituted alkyl, cycloalkyl or cycloalkylalkyl radical and provided that there is no halogen substituent on the carbon atom of the alkyl, cycloalkyl or cycloalky-

lalkyl radical which is directly attached to the nitrogen atom;

ring X is a pyrimidine, ring which may, where possible, carry a single optional substituent, the optional substituents on ring X being selected from fluorine, chlorine, bromine and iodine atoms and alkyl, alkoxy and alkylthio radicals of 1 to 6 carbon atoms, trifluoromethyl, hydroxy and amino radicals;

Z is a radical of the formula $-Y-(CH_2)_n-NH_2$, —Q—H or —Cl;

Y is an oxygen or sulphur atom, a direct bond, a methylene, cis or trans vinylene or sulphinyl radical or a radical of the formula NR^4 in which R^4 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms;

m is 0 to 4 and n is 1 to 5, provided that when Y is an oxygen atom, a sulphinyl radical or a radical of the formula NR^4, n is 2 to 5; and

Q is an oxygen or sulfur atom or a radical of the formula NR^4.

4,604,466

PIPERIDINE-SUBSTITUTED PYRIMIDINES

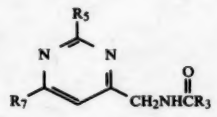
James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 519,707, Aug. 2, 1983, Pat. No. 4,478,835. This application Aug. 16, 1984, Ser. No. 641,515

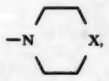
Int. Cl.[4] C07D *239/42, 239/47, 239/48, 239/46*

U.S. Cl. 544—330 **4 Claims**

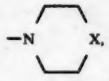
1. A compound of the formula



wherein R_3 is hydrogen, lower alkyl or phenyl; R_5 is amino, N-(lower)alkylamino, N,N-di(lower)alkylamino, mercapto, phenylthio, benzylthio, lower alkoxy, lower alkylthio or

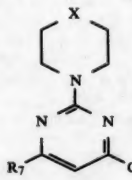


wherein X is methylene; and R_7 is hydrogen, methyl, lower alkoxy, lower alkylthio, or lower



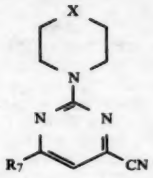
wherein X is methylene; with the proviso that at least one of R_5 and R_7 is said heterocyclic substituent.

3. The compound



wherein R_7 is hydrogen or methyl; and X is methylene.

4. The compound



wherein R_7 is hydrogen or methyl; and X is methylene.

4,604,467

CERTAIN 4-(3,4-DIBROMOCYCLOHEXYL)PYRIDINES

Venkataraman Ramachandran, and Paul F. Ranken, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 511,831, Jul. 8, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,672

Int. Cl.[4] C07D *213/26*

U.S. Cl. 546—346 **3 Claims**

1. 4-(3,4-Dibromocyclohexyl)pyridine.

4,604,468

INTERMEDIATE 1-ALKYLENYL-1H-BENZIMIDAZOL-2-ONE DERIVATIVES

Herbert Köppe, Ingelheim am Rhein; Anton Mentrup, Mainz-Kastel; Ernst-Otto Renth; Kurt Schromm, both of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim, and Gojko Musceic, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim International GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 371,072, Apr. 23, 1984, abandoned, which is a division of Ser. No. 255,751, Apr. 20, 1981, Pat. No. 4,343,800, which is a division of Ser. No. 112,640, Jan. 16, 1980, Pat. No. 4,296,117, which is a division of Ser. No. 4,279, Jan. 17, 1979, Pat. No. 4,256,756, and a continuation-in-part of Ser. No. 838,450, Oct. 3, 1977, abandoned. This application Jul. 25, 1984, Ser. No. 634,446

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2644833

The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.

Int. Cl.[4] C07D *235/26*

U.S. Cl. 548—305 **1 Claim**

1. A compound of the formula

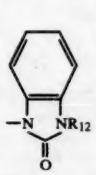
$$X_a—D—R_5'$$

wherein

X_a is halogen, mesyl, tosyl, or HNR_4—, where R_4 is hydrocarbyl aralkyl having from 7 to 14 carbon atoms;

D is alkylene having from 1 to 12 carbon atoms; and

R_5' is



where R_{12} is hydrogen or lower alkyl, with the proviso that when D is alkylene having from 2 to 6 carbon atoms and

R_{12} is a hydrogen or alkyl having from 1 to 4 carbon atoms, then R_4 cannot be benzyl.

4,604,469

PROCESS FOR THE RESOLUTION OF PYRANO[3,4-B]INDOLE-1-ACETIC ACIDS

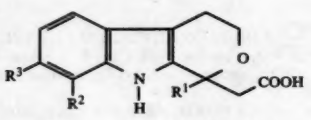
Christopher A. Demerson, Plainsboro, and Leslie G. Humber, North Brunswick, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 580,901, Feb. 16, 1984, Pat. No. 4,544,757. This application May 14, 1985, Ser. No. 734,001

Int. Cl.⁴ C07D *491/052*

U.S. Cl. 548—432 **3 Claims**

1. A (+) enantiomer of a compound of formula I



(I)

in which R^1 is lower alkyl, and R^2 and R^3 each is hydrogen, lower alkyl or halo.

4,604,470

PROCESS FOR THE ISOMERIZATION OF HALOGENATED THIOPHENES

Klaus Eichler, Eschborn, and Ernst I. Leupold, Neu-Anspach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,179

Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419555

Int. Cl.⁴ C07D *333/28*

U.S. Cl. 549—81 **13 Claims**

1. A process for isomerizing a mono-, di- or trihalogenated thiophene containing a halogen at an alpha position by moving the halogen to an adjacent beta position, which comprises bringing the mono-, di- or trihalogenated thiophene, or a mixture thereof, into contact with a zeolite catalyst of the pentasil, mordenite or faujasite type at a temperature between 150° and 550° C.

4,604,471

FURAN-3-CARBOHYDROXAMATES AND THEIR USE

Peter Neumann, Wiesloch; Michael Thomas, Weisenheim; Stefan Weiss, Neckargemuend, and Hübert Traüth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

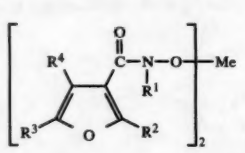
Filed Nov. 21, 1984, Ser. No. 673,784

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342219

Int. Cl.⁴ C07F *15/04, 15/06*

U.S. Cl. 549—210 **10 Claims**

1. A furan-3-carbohydroxamate of the formula:



wherein R^1 is C_1–C_{18}-alkyl, C_3–C_8-cycloalkyl which is unsubstituted or monosubstituted or disubstituted by C_1–C_4-alkyl, or phenyl which is unsubstituted or monosubstituted or disubstituted or trisubstituted by identical or different substituents selected from the group consisting of C_1–C_{12} alkyl, chlorine, bromine or C_1–C_{12} alkoxy, R^2 is methyl or ethyl, R^3 and R^4 independently of one another are each hydrogen, bromine, chlorine, or C_1–C_{18}-alkyl which is unsubstituted or monosubstituted or disubstituted by chlorine, bromine or C_1–C_4-alkoxy, or are each —CH_2—$COOR^5$, where R^5 is C_1–C_{18}-alkyl which is unsubstituted or monosubstituted or disubstituted by chlorine, bromine or C_1–C_4-alkoxy, and Me is divalent nickel or cobalt.

4,604,472

OCTAHYDRONAPHTHALENE DERIVATIVES AND THEIR PREPARATION

Junya Ide; Shigeki Muramatsu; Yoshio Tsujita, and Masao Kuroda, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

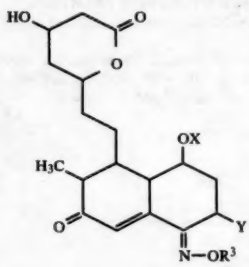
Continuation of Ser. No. 421,395, Sep. 22, 1982, abandoned. This application Jul. 9, 1985, Ser. No. 753,254

Claims priority, application Japan, Sep. 25, 1981, 56-151871

Int. Cl.⁴ C07D *309/30*

U.S. Cl. 549—292 **31 Claims**

1. The compounds of the formula:



(I)

wherein:

X is a hydrogen atom or a 2-methylbutyryl group;

Y is a hydrogen atom or a methyl group; and

R^3 is a hydrogen atom or an alkyl group having 1-6 carbon atoms.

4,604,473

PREPARATION OF METAL ALKYLS

David J. Cole-Hamilton, Ormskirk; Anthony C. Jones, St Helens, and John B. Mullin, West Malvern, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jun. 13, 1984, Ser. No. 620,256

Claims priority, application United Kingdom, Jun. 17, 1983, 8316605

Int. Cl.⁴ C07F *5/00*

U.S. Cl. 556—1 **10 Claims**

1. A method of providing a trialkyl gallium compound having the formula $(R_A)_3Ga$ wherein said formula R_A is independently selected from methyl and ethyl, said method comprising the steps of:

(a) forming an ether adduct of said trialkyl gallium compound, said ether adduct having the formula $(R_A)_3Ga.R_1R_2O$ by reacting, in a mixture, a gallium trihalide with a Grignard reagent in the presence of an ether, said Grignard reagent having the formula R_aMgQ wherein Q is a halogen and each R_A is independently selected from methyl and ethyl, said ether having a boiling point at least 50° C. above said trialkyl gallium compound, said ether having the formula R_1R_2O wherein R_1 and R_2 are independently selected from alkyl and phenyl radicals such that when R_1 and R_2 are both alkyl at least one of R_1 and R_2 has at least five carbon atoms; and

(b) heating said ether adduct to provide dissociation thereof

thereby releasing said trialkyl gallium compound of the formula $(R_4)_3Ga$ into the vapor phase.

4,604,474

RHODIUM-PHOSPHINE COMPLEX

Hidenori Kumobayashi, and Susumu Akutagawa, both of Kanagawa, Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,281
Claims priority, application Japan, Mar. 22, 1984, 59-53600
Int. Cl.[4] C07F *15/00*
U.S. Cl. 556—7 1 Claim

1. A rhodium-phosphine complex represented by the formula (I):

$$[Rh(p\text{-Tolyl BINAP})_2]^+ Y^- \quad (I)$$

wherein p-Tolyl BINAP represents 2,2'-bis(di-p-tolylphosphino)-1,1'-binaphthyl which is a racemic substance or optically active substance; and Y represents ClO_4, PF_6, BF_4 or PCl_6.

4,604,475

METHOD FOR MAKING ORGANOTIN HALIDES

Max Buschhoff, Luenen, and Wilhelm P. Neumann, Dortmund-Kirchhoerde, both of Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,486
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411834
Int. Cl.[4] C07F *7/22*
U.S. Cl. 556—97 5 Claims

1. A method for making an organotin halide of the formula R_3SnX, R_2SnX_2, or $RSnX_3$, or a mixture of two or more of such halides, wherein R is saturated hydrocarbon and X is halide, which comprises redistributing an appropriate mixture of an organotin compound of the type R_4Sn, R_3SnX, or R_2SnX_2 with a tin halide of the type R_2SnX_2, $RSnX_3$, or SnX_4 in a homogeneous phase at a temperature above about 210° C. in the presence of stannous fluoride as a catalyst.

4,604,476

ODOR-STABILIZED MERCAPTOALKYL ALKOXYSILANES AND A METHOD FOR THEIR PREPARATION

Claus-Dietrich Seiler, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Dec. 19, 1984, Ser. No. 683,385
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 3406534
Int. Cl.[4] C07F *7/08*
U.S. Cl. 556—401 8 Claims

1. An odor-stabilized mercaptoalkyl alkoxysilane, comprising 100 to 500 ppm of compounds containing oxirane groups.

4,604,477

METHOD FOR MAKING SILYLAROYLHALIDES AND REACTION PRODUCTS

Jonathan D. Rich, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1985, Ser. No. 718,039
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—436 10 Claims

1. A method for making halosilylaroylhalide which comprises,

(A) effecting reaction between substantially equivalent amounts of an aromatic polyacyl halide and an organic halopolysilane having halogen radicals attached to silicon in the presence of an effective amount of a transition metal catalyst,

(B) thereafter recovering silylaroylhalide from the mixture of (1).

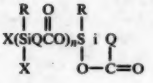
4,604,478

METHOD FOR SILALACTONE PREPARATION AND USE

Donnie R. Juen, Sanford, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 17, 1985, Ser. No. 734,999
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—439 14 Claims

1. A method comprising heating, under substantially anhydrous conditions, a reaction mixture comprising a catalyst selected from the group consisting of tertiary amines and tertiary phosphines and an ester having the formula $X_2RSiQ\text{-}COOR'$ wherein X denotes a chlorine or bromine atom, R denotes a monovalent hydrocarbon radical, Q denotes a divalent hydrocarbon radical, there being at least two carbon atoms in Q separating a silicon atom and a carbonyl carbon atom, and R' denotes an alkyl radical, said heating being sufficient to produce a silalactone composition having the formula



wherein X, R and Q have the meanings recited above and n has an average value greater than zero.

4,604,479

SILICONE-CONTAINING CONTACT LENS MATERIAL AND CONTACT LENSES MADE THEREOF

Edward J. Ellis, Georgetown, Mass., assignor to Polymer Technology Corporation, Wilmington, Mass.

Division of Ser. No. 327,279, Dec. 4, 1981, Pat. No. 4,424,328. This application Jun. 3, 1983, Ser. No. 501,293
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—440 2 Claims

1. 1,7-Bis(γ-methacryloxypropyl)-1,1,3,3,5,5,7,7-octa(trimethylsiloxy) tetrasiloxane.

4,604,480

METHOD FOR THE PREPARATION OF SULFONES AND COMPOUNDS CONTAINING CARBON CHAINS HAVING CONJUGATED UNSATURATION AND THE COMPOUNDS RESULTING FROM SUCH METHOD

Eric Block, Delmar, and Mohammad Aslam, Menands, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,276
Int. Cl.[4] C07F *7/04;* C07C *2/76*
U.S. Cl. 556—445 10 Claims

1. A method for the preparation of conjugated aliphatically unsaturated compounds, which comprises the steps of reacting a starting compound containing carbon-carbon aliphatic unsaturation with a 1-haloalkyl 1-sulfonyl bromide at a temperature below 25° for less than 12 hours followed by treating the reaction product with sufficient base to eliminate two hydrogen ions, one halogen ion, one bromine ion and an SO_2 group from the reaction product to yield a compound having two conjugated carbon-carbon double bonds.

4,604,481
COMPOUNDS FOR TREATMENT OR PROPHYLAXIS OF CARDIAC DISORDERS

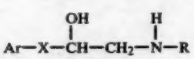
Sheung-tsam Kam, Vernon Hills; Paul W. Erhardt; Robert J. Borgman, both of Mundelein, all of Ill., and John P. O'Donnell, Morgantown, W. Va., assignors to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 211,341, Nov. 28, 1980, Pat. No. 4,405,642. This application May 25, 1983, Ser. No. 490,476

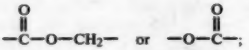
Int. Cl.[4] C07C *101/42, 101/30*

U.S. Cl. 560—39 **16 Claims**

1. A compound of the formula



wherein Ar is unsubstituted phenyl, phenyl substituted with fluoro in the ortho position, or phenyl substituted with methyl in the meta or para position; X is



and R is isopropyl, t-butyl or 3,4-dimethoxyphenethyl; with the proviso that when Ar is unsubstituted phenyl, or 4-methylphenyl R is isopropyl or 3,4-dimethoxyphenethyl; and with the further proviso that when X is

Ar is unsubstituted phenyl and R is 3,4-dimethoxyphenethyl; or a pharmaceutically acceptable salt thereof.

4,604,482
PROCESSES FOR PRODUCING α-FLUOROACRYLIC ACID ESTERS AND α-FLUOROACRYLIC ACID FLUORIDE

Akira Ohmori, Ibaraki; Shoji Takaki, Toyonaka, and Takahiro Kitahara, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Sep. 27, 1984, Ser. No. 655,078

Claims priority, application Japan, Oct. 4, 1983, 58-186326

Int. Cl.[4] C07C *67/317, 51/58*

U.S. Cl. 560—213 **16 Claims**

1. A process for producing an α-fluoroacrylic acid ester comprising providing a mixture comprising 2,2,3,3-tetrafluorooxetane, a metal halide, an alcohol and a dehalogenating agent to effect reaction thereof to produce an α-fluoroacrylic acid ester.

10. A process for preparing a compound represented by the formula

$$CH_2{=}CFCOF \qquad (I)$$

which comprises providing a mixture comprising 2,2,3,3-tetrafluorooxetane, a metal halide and a dehalogenating agent to effect reaction thereof to form a compound represented by said formula.

4,604,483
METHOD SEPARATING PHENYLALANINE AND CINNAMIC ACID

Tomohiko Kitsukawa; Hiroshi Kusano, both of Yokohama; Eiji Miyata, Komae, and Toyokazu Sugawara, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,015

Claims priority, application Japan, Feb. 28, 1984, 59-37050

Int. Cl.[4] C07C *99/12*

U.S. Cl. 562—443 **23 Claims**

1. A method of separating phenylalanine from an aqueous solution containing said phenylalamine and cinnamic acid as main components, which method comprises passing said solution through a packed layer of at least one synthetic adsorbant which is a cross-linked copolymer having a surface area of at least 100 m^2/g and a pore volume of at least 0.1 ml/g in the presence of a salt, a cation selected from an ammonium ion or an alkali metal ion and an anion selected from halogen, carbonate, or an aliphatic carboxylate at a concentration of 0.1N to 5N, and recovering a fraction of said phenylalanine substantially free from said cinnamic acid.

4,604,484
MONOALKYLATION OF 1-ALKYL-DIAMINOBENZENES

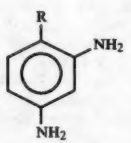
Kryn G. Ihrman, Farmington, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 397,488, Jul. 12, 1982, abandoned. This application Jul. 30, 1982, Ser. No. 403,289

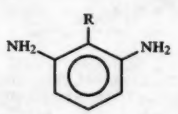
Int. Cl.[4] C07C *85/00, 87/50, 87/56*

U.S. Cl. 564—305 **10 Claims**

1. A process for the monoalkylation of 1-alkyl-2,4-diaminobenzene of structure:



or 1-alkyl-2,6-diaminobenzene of structure:



where R is a lower alkyl or cycloalkyl, said process comprising the steps of:

(a) reacting a 1-alkyl-2,4-diaminobenzene or a 1-alkyl-2,6-diaminobenzene at elevated temperature and pressure with an alkylene having at least three carbon atoms, in the presence of an aluminum anilide catalyst and a minor proportion of aniline; and

(b) recovering a monoalkylated product of 1-alkyl-2,4-diaminobenzene or 1-alkyl-2,6-diaminobenzene as the principal product.

4,604,485

CHEMICAL PROCESS

Howard M. Colquhoun, Knutsford, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Jun. 4, 1984, Ser. No. 616,895

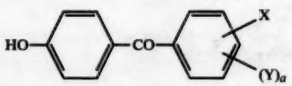
Claims priority, application United Kingdom, Jun. 7, 1983, 8315610

The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.

Int. Cl.[4] C07C *45/46*

U.S. Cl. 568—319 18 Claims

1. A process for the preparation of a 4-hydroxybenzophenone having the formula



which comprises polymerising a precursor of poly(4-oxybenzoyl) and reacting in situ the poly(4-oxybenzoyl) so formed with an aromatic compound of the formula

in the presence of an effective amount of a Lewis acid wherein

X represents hydrogen or a substituent that is not strongly electron-attracting;

Y is a substituent which is not strongly electron attracting, and

a is zero or an integer of 1 to 4;

the remaining substituents being hydrogen atoms and the overall effect of X and the substituents Y is not sufficient to deactivate the aromatic compound to such an extent that substitution occurs only with difficulty.

4,604,486

METHOD OF PREPARING OPTICALLY ACTIVE KETONES

Genichi Tsuchihashi, Tama, and Keisuke Suzuki, Chigasaki, both of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

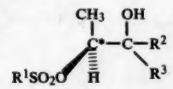
Filed Jan. 4, 1985, Ser. No. 689,007

Int. Cl.[4] C07C *45/51*

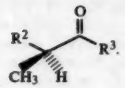
U.S. Cl. 568—322 7 Claims

1. In a Pinacol-type rearrangement, the improvement comprising:

contacting an optically active sulfonyloxy alcohol of the formula:



wherein R^1, R^2 and R^3 are each independently a C_1 to C_{20} hydrocarbon group which may contain N, O, P or S, and * indicates an asymmetric carbon atom, with an organoaluminum compound of the formula $R^4_{3-n}AlX_n$ wherein R^4 is a C_1 to C_{20} alkyl group, X is a halogen atom, an alkoxy group or a CN group, and n is 1, 1.5 or 2, to obtain an optically active ketone of the formula:



4,604,487

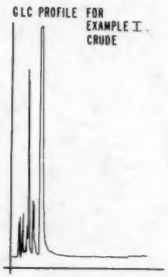
PROCESS FOR PREPARING PHENYL ALKANOL AND PERFUMERY USES OF RESULTING PRODUCT

Wilhelmus J. Wiegers, Red Bank, and Mark A. Sprecker, Sea Bright, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

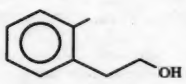
Division of Ser. No. 589,472, Mar. 14, 1984, Pat. No. 4,549,983, which is a continuation-in-part of Ser. No. 482,823, Apr. 7, 1983, Pat. No. 4,512,918. This application Jun. 21, 1985, Ser. No. 747,449

Int. Cl.[4] C07C *33/18*

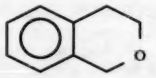
U.S. Cl. 568—715 3 Claims



1. A process for preparing a compound having the structure:



comprising the step of reacting the compound having the structure:



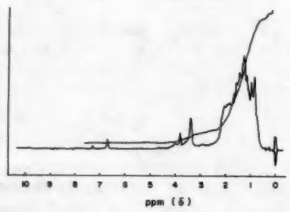
with hydrogen in the presence of a hydrogenation catalyst and an acid selection from the group consisting of mineral acids and and citric acid.

4,604,488

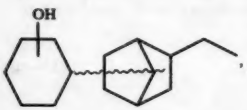
CYCLOHEXANOL DERIVATIVES AND FRAGRANCE COMPOSITIONS CONTAINING THE SAME

Yoshiaki Fujikura, Utsunomiya; Yasushi Kajihara, Ichikaimachi; Naotake Takaishi; Yoshiaki Inamoto, both of Utsunomiya; Akio Kimura, Wakayama; Motoki Nakajima, Miyashiromachi, and Norioki Miyamoto, Yotsukaido, all of Japan, assignors to Kao Corporation, Tokyo, Japan

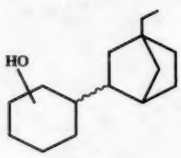
Filed Dec. 21, 1983, Ser. No. 563,972
Claims priority, application Japan, Dec. 22, 1982, 57-225264
Int. Cl.[4] C07C *35/22*
U.S. Cl. 568—820 15 Claims

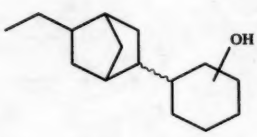


1. A fragrant mixture comprising at least one cyclohexanol derivative having the formula:



and





4,604,489

RECRYSTALLIZATION OF HEXANITROSTILBENE FROM DIMETHYLSULFOXIDE AND METHANOL

Eleonore G. Kayser, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 20, 1984, Ser. No. 602,577
Int. Cl.[4] C07C *79/10*
U.S. Cl. 568—931 3 Claims

1. A process for producing finely divided 2,2',4,4',6,6'-hexanitrostilbene-II (HNS-II) of uniform particle size comprising:

(1) dissolving conventional large particle 2,2',4,4',6,6'-hexanitrostilbene-II in hot dimethylsulfoxide (DMSO), wherein the large particle HNS-II had been produced by digestion of crude 2,2',4,4',6,6'-hexanitrostilbene-I in an organic solvent;

(2) injecting the hot dimethylsulfoxide solution through an opening of 0.70 mm or less in diameter into methanol which is kept at a temperature of from −50° C. to −80° C.; and

(3) isolating the finely divided particles of 2,2',4,4',6,6'-hexanitrostilbene-II which are produced in step (2).

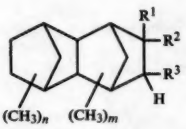
4,604,490

HIGH-DENSITY LIQUID FUEL

Hitoshi Yuasa, Yokohama; Mitsuo Matsuno, Kawasaki, and Hirosuke Imai, Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Japan

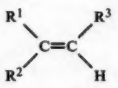
Filed Jun. 19, 1985, Ser. No. 746,279
Claims priority, application Japan, Jun. 21, 1984, 59-127768; Aug. 27, 1984, 59-177673
Int. Cl.[4] C07C *13/28, 2/50*
U.S. Cl. 585—21 10 Claims

1. A high-density liquid fuel consisting essentially of a compound of the formula



wherein each of m and n is 0 or 1, and each of R^1, R^2 and R^3 is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, the sum of carbon atoms in R^1, R^2 and R^3 being an integer of 1 to 3;

prepared by reacting an aliphatic unsaturated hydrocarbon having 3 to 5 carbon atoms of the formula



wherein R^1, R^2 and R^3 are as defined above,

with cyclopentadiene, methylcyclopentadiene and mixtures thereof in accordance with the Diels-Alder reaction to synthesize a 1:2 adduct of the unsaturated hydrocarbon and the pentadiene, and then hydrogenating the thus synthesized adduct, or by reacting 5-ethylidenenorbornene-2 with cyclopentadiene, methylcyclopentadiene or mixtures thereof in accordance with the Diels-Alder reaction to produce a 1:1 of adduct of 5-ethylidenenorbornene-2 and the pentadiene, and hydrogenating carbon-carbon double bonds in the adduct.

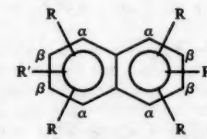
4,604,491

SYNTHETIC OILS

Hans Dressler, Monroeville, Pa., and Albert A. Meilus, Parma, Ohio, assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1984, Ser. No. 674,881
Int. Cl.[4] C07C *13/47, 15/20*
U.S. Cl. 585—26 21 Claims

1. A synthetic base oil for functional fluids and greases comprising a mixture of monoalkylated naphthalenes and polyalkylated naphthalenes, said naphthalenes represented by the formula:



wherein the R' groups are independently selected from H and

methyl, the monoalkylated naphthalenes have three R groups which are H and one R group which is a 12–26 carbon alkyl, the polyalkylated naphthalenes have from two to four R groups which are 12–26 carbon alkyl and any remainder groups H, the weight ratio of monoalkylated naphthalenes to polyalkylated naphthalenes is from 5:95 to 70:30 when the average alkyl group is C_{12}–C_{16} and from 5:95 to 99:1 when the average alkyl group is C_{17}–C_{26} and the oil has a viscosity at 210° F. between 61 and 88 SUS, a viscosity index between 105 and 136, and a flash point (COC=Cleveland open cup) of between 508° F. and 560° F.

4,604,492

DICYCLOHEXYLCYCLOPENTANE COMPOUNDS

Nobuaki Shimizu; Toshiyuki Tsubouchi, both of Sodegaura, and Hitoshi Hata, Ichihara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

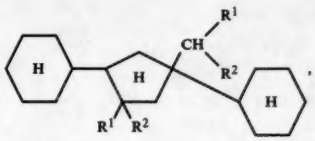
Filed Oct. 8, 1985, Ser. No. 785,458

Claims priority, application Japan, Oct. 23, 1984, 59-221182

Int. Cl.⁴ C07C *13/28*

U.S. Cl. 585—360 **5 Claims**

1. A dicyclohexylcyclopentane compound represented by the general formula



in which R^1 and R^2 are each a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms.

4,604,493

1-CYCLOHEXYL-1,4-DIMETHYL DECAHYDRONAPHTHALENE AND A WORKING FLUID FOR TRACTION DRIVE FORMULATED THEREWITH

Nobuaki Shimizu; Toshiyuki Tsubouchi, both of Sodegaura, and Hitoshi Hata, Ichihara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

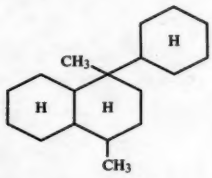
Filed Oct. 8, 1985, Ser. No. 785,457

Claims priority, application Japan, Oct. 18, 1984, 59-218892

Int. Cl.⁴ C07C *13/50*

U.S. Cl. 585—360 **3 Claims**

1. 1-Cyclohexyl-1,4-dimethyl decahydronaphthalene expressed by the structural formula

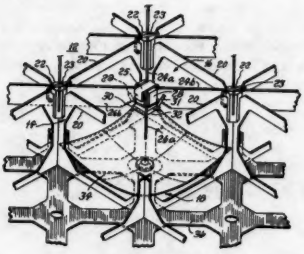


4,604,494

PHOTOVOLTAIC CELL ARRAY WITH LIGHT CONCENTRATING REFLECTORS

Neal F. Shepard, Jr., King of Prussia, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Nov. 7, 1984, Ser. No. 669,082
Int. Cl.[4] H01L *25/02;* H02N *6/00*
U.S. Cl. 136—246 19 Claims



1. A solar battery array comprising:

a succession of first and second mutually spaced, elongate, electrical conductors, said first and second conductors alternating with each other and being generally parallel, each of said conductors being substantially rigid and having a configuration adapted to reject substantial amounts of heat by radiation to space;

a series of mutually spaced solar batteries positioned between successive conductors such that each of said series is bracketed by a first and a second conductor;

each of said solar batteries including a photovoltaic cell carried by an electrically insulating cell holder, and a reflector spaced from said cell, said reflector being shaped to concentrate incident light on a light receiving cell surface;

each of said cell holders bridging the bracketing pair of conductors and being fastened thereto to form a substantially rigid cell support structure therewith; and

the cells in each of said series of batteries having terminals of opposite polarity connected to respective conductors of the bracketing conductor pair such that all cells in a given series are connected in parallel with each other and the respective series of batteries are connected seriatim;

whereby the voltage potential of said array varies with the total number of said battery series in the array, and the current capacity of said array varies with the number of solar batteries per series.

4,604,495

SEMICONDUCTOR DEVICE AND PROCESS FOR PRODUCING SAME

Hisashi Watanabe, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

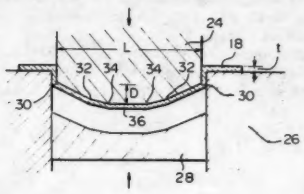
Filed Dec. 19, 1984, Ser. No. 683,735
Claims priority, application Japan, Dec. 21, 1983, 58-241307
Int. Cl.[4] H01L *23/04*
U.S. Cl. 174—52 FP 7 Claims

1. A ceramic-type semiconductor package comprising:

a semiconductor pellet;

a ceramic lead base having a cavity for accommodating said pellet; and

a metal cap for sealing said cavity, said cavity being upward opened and said metal cap having a central depressed portion to be inserted into said cavity, said central depressed portion having a bottom wall portion which has a plurality of facets.

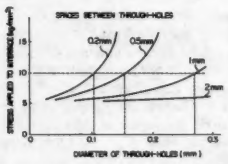


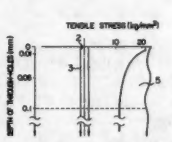
4,604,496

CERAMIC MULTILAYER WIRING BOARD

Shosaku Ishihara, Kamakura; Takashi Kuroki, Yokohama; Gyozo Toda, Hino; Akio Yasukawa, and Tatsuji Sakamoto, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd, Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,582
Claims priority, application Japan, Aug. 25, 1983, 58-154052
Int. Cl.[4] H05K *1/02*
U.S. Cl. 174—68.5 6 Claims





1. In a ceramic multilayer wiring board having ceramic insulating layers and wiring patterns provided thereon, said wiring patterns being connected through said ceramic insulating layers by conductors filling a plurality of through-holes formed on said ceramic insulating layers, the improvement in which each of the through-holes range from 0.103 to 0.26 mm in diameter at the superficial portions thereof located at both sides of said ceramic multilayer wiring board, the space between adjacent superficial portions of the through-holes ranges from 0.2 to 1 mm, and the depth of the superficial portions of the through-holes is 0.1 mm or more; said superficial portions of the through-holes being smaller in diameter than inside portions of the through-holes arranged between said superficial portions.

4,604,497

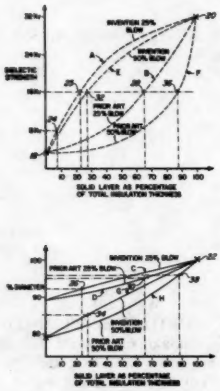
ELECTRICAL CONDUCTOR FOR TELECOMMUNICATIONS CABLE

John M. Bell, Seeley's Bay, and Peter J. Schmidt, Gananoque, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 518,059, Jul. 28, 1983, abandoned, which is a continuation of Ser. No. 253,312, Apr. 13, 1981, abandoned. This application Mar. 4, 1985, Ser. No. 707,765

Int. Cl.[4] H01B *7/02*

U.S. Cl. 174—110 F **4 Claims**



1. A telecommunications cable having an air-core in which a plurality of insulated electrical conductors are provided, each of which comprises a conductor of diameter between 0.0126 inch and 0.0360 inch having insulation comprising an unpigmented inner layer of solid non-cellular polyolefin based composition of at least 2 mils thick, and an outer layer of cellular polyolefin based composition wherein the cells provide an air space which is at least 15% of the total volume of the outer layer and wherein the nominal mutual capacitance between conductors is at 83 nanofarads/mile and a predetermined dielectric breakdown value between conductors is obtained, the maximum outside diameter across the insulation being less than that of an electrical conductor of equal conductor diameter which provides the same nominal mutual capacitance with a solid non-cellular insulation of the same material as said inner layer.

4,604,498

SEAL BETWEEN A METALLIC MOUNTING AND A GLASS FIBER ROD IN HIGH VOLTAGE COMPOUND INSULATORS AND METHOD OF FORMING SAME

Martin Kuhl, Selb/Bayern, Fed. Rep. of Germany, assignor to Hoechst CeramTec AG, Selb, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,622

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302788

Int. Cl.[4] H01B *17/02, 17/46*

U.S. Cl. 174—140 S **9 Claims**

1. A high voltage insulator comprising:

(a) a synthetic plastic rod;

(b) an electrically insulating coating on at least a portion of said rod;

(c) a suspension mounting into which an end of said rod is inserted, said suspension mounting surrounding at least a portion of said coating at the location where said rod is inserted to form a gap between (i) said rod and coating and (ii) said suspension mounting, and

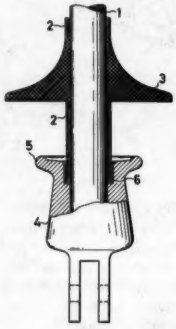
(d) a single, unitary seal in said gap completely filling the cavities between the rod and coating and the mounting, said seal comprising a cross-linked siloxane reaction product of two or more reactive components, said reaction product being incapable of flow and remaining sticky after cross-linking and having a penetration value after cross-linking of between about 1 and about 500 mm/10 with a 150 g hollow cone.

7. A method for sealing a high voltage insulator comprising:

(a) a synthetic plastic rod;

(b) an electrically insulating coating on said rod; and

(c) a suspension mounting into which at least one end of said rod is inserted, said suspension mounting surrounding said coating at the location where said rod is inserted,



said method comprising the steps of (1) providing a cross-linkable mixture of at least two reactive components which form a cross-linked siloxane upon reaction, (2) pouring said mixture into a gap between said coating and said suspension mounting filling the cavities of the gap between rod, coating and mounting, and (3) permitting the components of said mixture to react and form a single, unitary seal consisting of a siloxane reaction product which is incapable of flow and remains sticky after cross-linking.

4,604,499

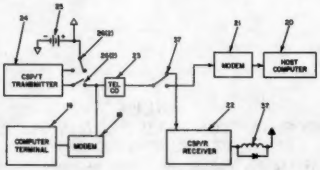
COMPUTER TELEPHONE ACCESS SECURITY PROCESSOR

Lawrence R. Hughes, Lauderdale Lakes, Fla., assignor to Raymond F. Hughes, Tamarac, Fla.

Filed Feb. 24, 1984, Ser. No. 582,392

Int. Cl.[4] H04M *11/00;* **H04L** *9/00*

U.S. Cl. 179—2 DP **1 Claim**



1. A computer security processor comprising a transmitter unit and a receiver unit in communication with each other via a telephone system; wherein

said transmitter unit comprises: means for manually setting a desired code, means responsive to the setting means for generating dual frequency tone signals corresponding to the desired code, means for connecting the generating means to a telephone line for transmitting the dual frequency tone signals over the telephone system, and means

for manually initiating operation of the generating and transmitting means;

said receiver unit comprises: means for manually setting the desired code in the receiver unit, means connected to a second telephone line for receiving dual frequency tones transmitted over said telephone system and deriving a received code therefrom, means connected to the manual setting means and the receiving means for comparing the received code to the desired code, means responsive to the comparing means for recognizing a fraudulent code and disconnecting the receiving means from the second telephone line, and means responsive to the comparing means for recognizing receipt of the desired code and connecting a computer to said second telephone line; and wherein

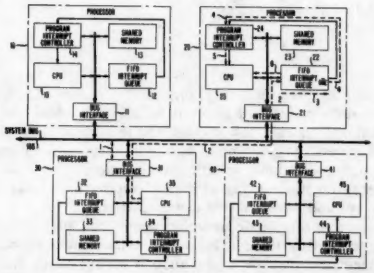
said dual frequency tone signals have frequencies different from dual frequency tone signals used by the telephone system for dialing purposes.

4,604,500

MULTIPROCESSING INTERRUPT ARRANGEMENT

Sanford S. Brown, River Plaza; Dennis J. Hunsberger, Lincroft, and Michael R. Lundberg, Bridgewater, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 2, 1981, Ser. No. 326,908
Int. Cl.[4] G06F *9/00*
U.S. Cl. 179—18 ES **13 Claims**



1. An interrupt system for use with each processor of a multiprocessor communication or telephone network, where one processor may request actions of another responding processor independent of the state of the other processors, said system comprising

means including a FIFO memory for queuing interrupt vector messages directed from a requesting processor to a particular other responding processor and received via said network directly from said requesting processor without intervention by any other processor, and

means controlled only by said responding processor for sequentially providing to said directed processor an interrupt signal for each said queued vector message.

4,604,501

VOICE COMMUNICATION SYSTEM

Moscow K. Richmond, 2819 Butler Ave., Los Angeles, Calif. 90066; Thomas R. Richmond, Santa Ana, and Patrick S. Kochie, Simi Valley, both of Calif., assignors to Moscow K. Richmond, Los Angeles, Calif.

Filed Oct. 9, 1984, Ser. No. 658,765
Int. Cl.[4] H04M *1/60*
U.S. Cl. 179—81 B **27 Claims**

1. A voice communication system comprising:

(a) a first speaker and a first microphone at a first location which is generally a relatively quiet location,

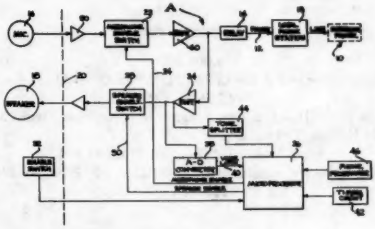
(b) a second speaker and a second microphone at a second location which may have relatively substantial background noise,

(c) a telephone line between the first speaker and first microphone and second speaker and second microphone,

(d) monitor means for monitoring the telephone line to determine if audible sounds are being generated at the first microphone or at the second microphone while temporarily disabling one of said microphones, and

(e) control means responsive to said monitor means for automatically transferring transmit control to the first microphone and disabling said second microphone such that transmission cannot occur through said second microphone when audible sounds are generated at said first microphone and for enabling said second microphone to transmit only when audible sounds are not generated at said first microphone.

13. A method of controlling voice communication in a voice communication system where a first speaker and a first microphone are located at a first location which is generally a relatively quiet location and a second speaker and a second microphone are located at a second location which may have rela-



tively substantial background noise, and which voice communication system comprises a telephone link between the first speaker and first microphone and second speaker and second microphone, said method comprising:

(a) periodically monitoring said telephone link to determine whether audible sound is present on and being carried over said link,

(b) automatically temporarily disabling the microphone at the second location so that no communication can originate from the second location and enabling the speaker at the second location to thereby dedicate transmit control to the microphone at the first location whenever sound to be transmitted is generated at the first location,

(c) enabling the microphone at the second location when no audible sound to be transmitted is generated at the first location, and

(d) automatically returning microphone control to the microphone at the first location when audible sound to be transmitted is again generated at the first location.

4,604,502

JOYSTICK CONTROL

David S. Thomas, 29998 MacIntyre, Livonia, Mich. 48150

Filed Jul. 5, 1985, Ser. No. 751,888
Int. Cl.[4] H01H *25/00*
U.S. Cl. 200—6 A **12 Claims**

1. An improved joystick control device comprising:

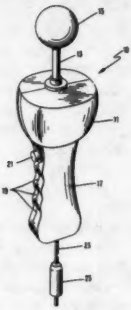
(a) an upper housing portion;

(b) a control rod extending upwardly from said upper housing portion;

(c) a hand grip held housing portion depending downwardly from said upper housing portion; and

(d) switch means in said upper housing portion, said switch means having actuating means facing downwardly in a direction substantially opposite to the direction of elonga-

tion of said control rod and operatively connected to said control rod by a movable plate means whereby controlled



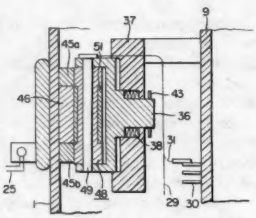
movement of said control rod selectively actuates said switch means.

4,604,503

CHANGE-OVER SWITCH FOR AN ON-LOAD TAP CHANGER

Yasushi Fuwa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1984, Ser. No. 681,194
Claims priority, application Japan, Dec. 15, 1983, 58-234975
Int. Cl.⁴ H01H *19/54, 1/16*
U.S. Cl. 200—11 TC **2 Claims**



1. A change-over switch for an on-load tap changer, comprising:

a cylindrical housing having a first center axis, and having a plurality of stationary contacts fixed to the cylindrical periphery thereof, said plurality of stationary contacts including first and second stationary contacts subtending different overlapping angular arcs about said first center axis;

an electrically conductive bushing having a second center axis parallel said first center axis;

a principle roller contact and an arc interrupting roller contact electrically connected to said bushing, having peripheral surfaces movable circumferentially with respect to said center axis into and out of engagement with said stationary contacts and rotatably mounted in axial alignment on said bushing for rotation about said second center axis, said principle roller contact and said arc interrupting roller contact being integrally formed of an electrically conductive roller member having a first cylindrical surface exposed so as to be rollable on said first stationary contact and an unexposed second cylindrical surface, said arc interrupting roller contact including a cylindrical layer of arc resistive material formed on said unexposed second cylindrical surface so as to be rollable on said second stationary contact;

a roller contact holder supporting axially opposite ends of said bushing; and

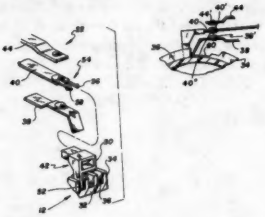
means, engaging said roller contact holder, for rotating said principle roller contact and said arc interrupting roller contact about said first center axis such that said principle roller and said arc interrupting roller respectively roll successively on and off said first and second stationary contacts.

4,604,504

TIMER BLADE ARRANGEMENT

Garry A. Stout, Bargersville, and Leroy A. Perry, Danville, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 487,976, Apr. 25, 1983, abandoned.
This application May 16, 1985, Ser. No. 734,826
Int. Cl.⁴ H01H *43/00;* **F16H** *53/06*
U.S. Cl. 200—38 B **4 Claims**



1. A timing mechanism comprising:

(a) a camstack including a hub portion and individual cams extending from said hub portion and providing channels therebetween, at least one of said individual cams having at least two cam lobes of different elevations,

(b) a first spring blade engaging said at least one individual of said cams and having a first electrical contact,

(c) a second spring blade mounted above said first spring blade and having a second electrical contact engaging said first electrical contact, and a second spring blade third electrical contact,

(d) a third spring blade mounted above said second spring blade having a fourth electrical contact engaging said third electrical contact,

(e) follower means mounted on said second spring blade engaging said hub portion in one of said channels and establishing a fixed air gap between said first and second electrical contacts when they are in a relaxed position.

4,604,505

SWITCH-PLUG INTERLOCK

William H. Henninger, Paramus, N.J., assignor to ERO, Inc., Glasser, N.J.

Filed May 17, 1985, Ser. No. 735,274
Int. Cl.⁴ H01H *9/20*
U.S. Cl. 200—50 B **9 Claims**

1. A receptacle for receiving a plug having a locking collar comprising:

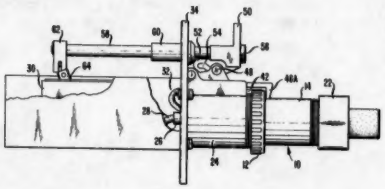
a frame;

an electrical connector mounted on said frame and having a locking means for engaging and holding said collar;

a switch means mounted on said frame, connected to said connector and operable to disconnect said connector; and

a manually operable interlock means having an on and off position, said interlock means being supported on said frame for manually operating said switch means to apply power to said connector after the securing of said plug into said connector, said interlock means being positioned adjacent said connector and being responsive to the securing thereon of said collar, said interlock means being

restrained from moving to said on position without said collar being secured to said locking means, said interlock means including:



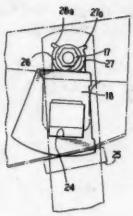
grasping means extending beyond said locking means for grasping said plug on a rearward external surface of said collar and preventing disengagement from said locking means in response to said interlock means being placed in said on position.

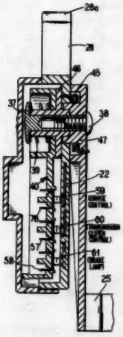
4,604,506

SELF-ADJUSTING SWITCH MECHANISM

Wallace E. Gebhardt, Logansport, Ind., assignor to Switches, Inc., Logansport, Ind.

Filed Jul. 10, 1985, Ser. No. 753,446
Int. Cl.[4] H01H *3/14, 21/36*
U.S. Cl. 200—61.89 **10 Claims**





1. A switch assembly for a vehicle braking system comprising:

a housing,

means on said housing arranged to frictionally engage a brake pedal arm pivot yoke in said vehicle,

restraining means restraining pivotal movement of said housing,

a switch actuator arm arranged to be coupled to the brake pedal arm on said vehicle,

a switch actuator disposed within said housing,

a friction clutch means interposed between said switch actuator arm and said switch actuator to permit first a driving and then a slippable connection therebetween whereby said switch actuator arm can pivot to a greater angular extent than said switch actuator,

a plurality of electrical contacts carried by said switch actuator, circuit means engageable by said electrical contacts to make or break electrical contact therebetween,

means within said housing limiting the pivotal movement of said electrical contacts to a predetermined arc, and

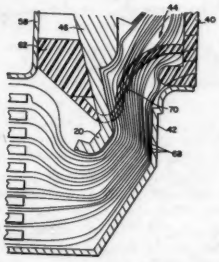
terminal means connected to said circuit means and extending outside said housing.

4,604,507

MINIATURE CIRCUIT BREAKER WITH IMPROVED INSULATION LEVEL

Jean-Pierre Roulet Dubonnet, Eybens; Louis Boillot, Grenoble, and Gilbert Mora, St. Nicolas de Macheran, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Dec. 11, 1984, Ser. No. 680,465
Claims priority, application France, Dec. 26, 1983, 83 20899
Int. Cl.[4] H01H *33/04*
U.S. Cl. 200—144 R **4 Claims**



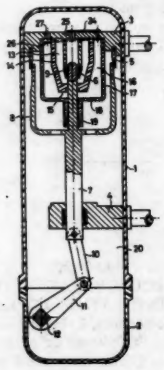
1. A miniature electric circuit breaker with an insulating moulded casing having an arc formation chamber, a pair of cooperating fixed and movable contacts disposed in said arc formation chamber and generating inside said arc formation chamber an electrical field defined by equipotential lines in a separation zone of said contacts in an open position, an arc extinction chamber communicating with the arc formation chamber, a mechanism for moving said contacts between an engaged condition and a disengaged condition, a chamber for the mechanism housing separated from the arc formation chamber by an intermediate insulating partition having a rectangular slot and two ribs for laterally delimitating said slot, a carrier supporting the movable contact and crossing said slot for cooperating with said mechanism, said carrier being longitudinally movable within said rectangular slot and laterally encompassed by said ribs, said ribs extending at least over a part of their length parallel to the equipotential lines of said electrical field, so that said ribs are submitted to a zero potential gradient and prevent any current creepage along said partition ribs.

4,604,508

ELECTRIC CIRCUIT BREAKER OF THE TYPE USING AN ARC QUENCHING FLUID WITH PRESSURE SELF-GENERATING DUE TO THE BREAKDOWN OF THE FLUID

Gianpietro Talpo, Bergamo, Italy, assignor to SACE S.p.A. Costruzioni Elettromeccaniche, Bergamo, Italy

Filed Jan. 14, 1985, Ser. No. 691,014
Claims priority, application Italy, Jan. 20, 1984, 20599/84[U]
Int. Cl.[4] H01H *33/74*
U.S. Cl. 200—148 R **8 Claims**



1. Electric circuit breaker of the type using an arc extinguishing fluid with pressure self-generating by the breakdown of the fluid due to the same arc, comprising, inside a tightly sealed insulating casing filled with the extinguishing fluid, in particular with a gas such as sulphur hexafluoride, two plate-shaped current bearing connections, of which one supporting a stationary main contact and a tubular stationary arc contact, and the other being provided with a guide for a stem supporting a movable main contact and a rod-shaped movable arc contact, a drive mechanism for moving said stem from a closure position to an opening position of the contacts and vice-versa, a first extinguishing fluid collecting and compression chamber surrounding the tubular stationary arc contact and provided with an outlet opening adapted to be closed by said movable arc contact, at least a further collecting and compression chamber outboard of said first chamber provided with an outlet opening, characterized in that the stationary main contact and the movable main contact are outboard of said further chamber, the outlet openings of the first chamber and of the further chamber are coaxial and alined with the axis of the rod-shaped movable arc contact, and the movable arc contact defines means for closing the outlet opening of the further chamber, and the outlet opening of the first chamber is in fluid communication with the outlet opening of the further chamber.

4,604,509

ELASTOMERIC PUSH BUTTON RETURN ELEMENT FOR PROVIDING ENHANCED TACTILE FEEDBACK

Kevin F. Clancy, and Ralph J. Schneider, both of Freeport, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

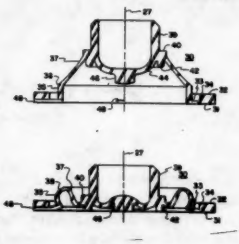
Filed Feb. 1, 1985, Ser. No. 697,294
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—159 B **23 Claims**

17. A push button assembly with enhanced tactile characteristics comprising:

a base having a mounting surface thereon;

a push button adapted for movement along an axis relative to said mounting surface; and

an elastomeric return element extending along the axis between said mounting surface and said push button, said elastomeric return element being formed with an annular flange having lower surface in contact with said mounting surface, a hollow member including a first section having a predetermined diameter joined to said flange through a radially extending web characterized by greater flexibility than the first section, the web having a surface which is



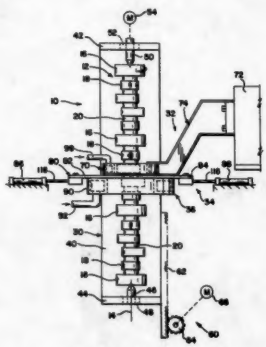
continuous with the lower surface of the flange, the hollow member further including a second section joined to the first section and having a diameter which decreases with distance along the axis away from said mounting surface, and a crown remote from said mounting surface connected to said push button.

4,604,510

METHOD AND APPARATUS FOR HEAT TREATING CAMSHAFTS

John R. Laughlin, Broadview Heights, and George M. Mucha, Parma Heights, both of Ohio, assignors to Tocco, Inc., Boaz, Ala.

Filed May 20, 1985, Ser. No. 736,214
Int. Cl.[4] H05B *6/40*
U.S. Cl. 219—10.43 **26 Claims**



1. An apparatus for heat treating a plurality of unhardened cam lobes on a camshaft, comprising:

support means for supporting the camshaft for rotation about a longitudinal axis;

means for selectively rotating said camshaft about said axis;

inductor means adapted to encircle the cam lobes in inductive heating relationship therewith;

drive means for locating said inductor means sequentially at the unhardened cam lobes;

shield means movable to an operative position closely encircling the camshaft between successive cam lobes including the cam lobes then located at said inductor means;

means for energizing said inductor means when said shield means is in said operative position to inductively heat the

unhardened cam lobe to a predetermined heat treating temperature;

first cooling means operative subsequent to said energizing for delivering liquid media on the cam lobe at said heat treating temperature and cool such cam lobe at a controlled rate to provide a predetermined surface hardness;

second cooling means for delivering liquid media on the hardened cam lobe adjacent said shield means after said shield means is in said operative position concurrent with said inductor means and said first cooling means, said second cooling means providing sufficient cooling of said hardened cam lobe to prevent tempering thereof.

4,604,511

METHOD FOR PRODUCING HEAVY STRUCTURAL ELEMENTS

Josef Grosse-Wördemann, Osnabrück, and Herbert Luckow, Düsseldorf, both of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft vorm. August Thyssen-Hütte, Duisburg-Hamborn, Fed. Rep. of Germany

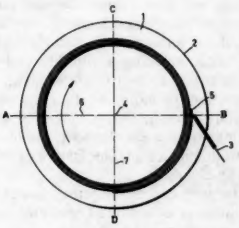
Continuation of Ser. No. 314,019, Oct. 22, 1981, abandoned.

This application May 11, 1984, Ser. No. 609,477

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040296

Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—76.14 **10 Claims**



1. A method for manufacturing large cylindrical structural elements comprising the steps of:

providing a pair of thick-walled cylindrical components each defining a longitudinal axis and each having a planar abutting surface at one end thereof, said cylindrical components being adapted to be joined together by welding at said planar abutting surfaces;

applying between said cylindrical components on at least one of said planar abutting surfaces at least one buffer layer of weld material, said buffer layer being applied by arc welding with a welding electrode having an axis;

holding said welding electrode with the axis thereof at an oblique angle relative to said planar abutting surface while said buffer layer is applied, said buffer layer being applied in the form of weld beads which overlap at their flanks by 50–70% of their width;

maintaining said axis of said electrode at an angle to two reference planes perpendicular to each other intersecting at said axis of said component, one of said reference planes passing through the weld point at which said at least one buffer layer is applied; and

holding said axis of said electrode at a first tracking angle in relation to the reference plane passing through the weld point, and at a second tracking angle with relation to the other of said reference planes of between 15° and 50°.

4,604,512

HEAT EXCHANGER TUBE REPAIR

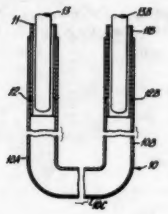
John Stacey, Breightmet, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 4, 1984, Ser. No. 596,723

Claims priority, application United Kingdom, May 13, 1983, 8313266

Int. Cl.[4] B23K *1/04*

U.S. Cl. 219—85 M **5 Claims**



1. In the method of repairing a heat exchanger tube which is leaking where it is welded to a tube plate comprising the insertion of a length of repair tube into the leaking tube through the tube plate with the inserted inner end of the repair tube brazed to the leaking tube and the other end of the repair tube explosively welded to the tube plate, the step of relieving heat-produced axial strain in the leaking tube while subjecting the leaking tube to the heat produced by the brazing.

4,604,513

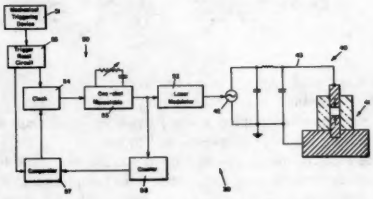
COMBINATION OF A LASER AND A CONTROLLER FOR TRIMMING A METALLIZED DIELECTRIC FILM CAPACITOR

Basilio Y. Lim, 12931 Sunnyside Pl., Santa Fe Springs, Calif. 90670

Filed May 7, 1985, Ser. No. 731,851

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LA **1 Claim**



1. A combination of a laser system and a controller for use in vaporizing the material of a capacitor, which is formed from a pair of metallized dielectric films, to form a hole in order to trim the capacitance of said capacitor, said combination comprising:

a. a laser system including a laser modulator which turns said laser system on and off at a freqency rate of two hundred cycles per second; and

b. a controller including a mechanical triggering device, a trigger/reset circuit which is electrically coupled to said mechanical triggering circuit and which provides a trigger signal in its triggered state and a reset signal in its untriggered state, a clock circuit which is electrically coupled to said trigger reset circuit and which provides clock signals in response to said trigger signal, a one-shot monostable, multivibrator circuit having an RC timing circuit which is electrically coupled to said clock circuit

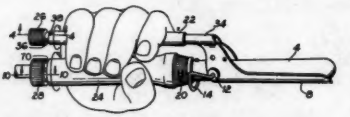
and to said laser modulator and which controls the pulse width of its output signal in a range of 0.005 seconds and 0.1 seconds in response to the clock signals, a counter which is electrically coupled to said one-shot monostable, multivibrator circuit and which counts each of said clock signals and a comparator which is electrically coupled to said counter in order to compare the number of said counted clock signals to a selected number and which is electrically coupled to said clock circuit, so that, when the number of said counted clock signal equals the selected number, said comparator provides a clock inhibit signal in order to inhibit said clock circuit from providing any more clock signals.

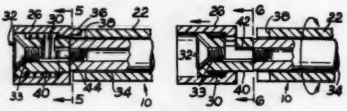
4,604,514

ELECTRIC CURLING IRON WITH SELECTIVELY LOCKABLE ROTATABLE HANDLES

Arnold Thaler, Plantation, Fla., and Lai Kin, Kowloon, Hong Kong, assignors to Windmere Corporation, Hialeah, Fla.

Filed May 15, 1984, Ser. No. 610,567
Int. Cl.[4] H05B *3/00*; A45D *1/04, 1/18*
U.S. Cl. 219—225 **25 Claims**





1. A rotatable curling iron comprising:

a heat conductive cylinder having an outer surface;

a main handle coupled to said cylinder, said main handle being rotatable relative to said cylinder;

first locking means on said main handle and cylinder and movable between a first position for coupling and locking said main handle to said cylinder, in which position said main handle is prevented from rotating, and a second position for uncoupling said main handle from said cylinder, in which position said main handle is free to rotate relative to said cylinder, said first locking means being biased toward said first position, said first locking means including first retaining means releasably retaining said first locking means in its second position when moved into such second position;

clamping means having a partial cylindrical clamp member having inner and outer surfaces, said inner surface of said clamp member being contoured to wrap around a portion of the outer surface of said cylinder for clamping hair between said cylinder and said clamp member and a clamping handle coupled to said clamp member; and

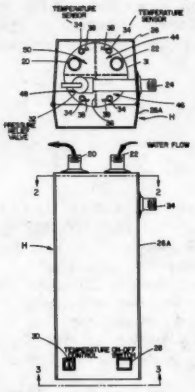
means for pivotably coupling said clamping means to said cylinder so that said clamp member can be pivoted with respect to said cylinder by manipulation of said clamping handle.

4,604,515

TANKLESS ELECTRIC WATER HEATER WITH STAGED HEATING ELEMENT ENERGIZATION

Mel Davidson, Houston, Tex., assignor to CMR Enterprises, Inc., Houston, Tex.

Filed Oct. 16, 1984, Ser. No. 661,372
Int. Cl.[4] H05B *1/02, 3/82*; F24H *1/10*
U.S. Cl. 219—298 **9 Claims**



1. A water heater comprising:

(a) a housing, including heater inlet and outlet ports adapted to receive and discharge, respectively, water to be heated and circulated along a flow path through the housing;

(b) the housing including a plurality of heating chambers, serially connected along the flow path;

(c) each chamber including an inlet and outlet;

(d) a separate heating means and a separate temperature sensing means for each chamber, the temperature sensing means producing a signal indicative of the water temperature in the chamber;

(e) an outlet temperature selecting means for producing a signal indicative of a desired temperature for water flowing through the outlet port; and

(f) control means connected to each heating means and responsive to the signals produced by each of the temperature sensing means and to the signal produced by the outlet temperature selectivng means for individually controlling the energization of each of said separate heating means to maintain the water flowing through the outlet port at a desired temperature by energizing the heating means in each chamber only if the temperature of the water in that chamber as sensed by the temperature sensing means in that chamber is below the desired outlet temperature as selected by said outlet temperature selecting means.

4,604,516

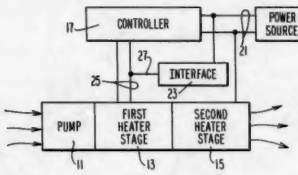
CASCADED ARRANGEMENT FOR ELECTRICALLY HEATING FLUIDS TO HIGH TEMPERATURE

Bruce E. Metz, Wilmington, Del., assignor to Athena Controls Inc., Plymouth Meeting, Pa.

Filed Jul. 19, 1983, Ser. No. 515,161
Int. Cl.[4] H05B *1/02*; F24H *1/10, 3/04*
U.S. Cl. 219—379 **7 Claims**

1. A cascaded fluid heating arrangement comprising in combination: pump means formed to discharge a relatively constant stream of fluid; electrical power source means; temperature controller means connected to said electrical power source means to receive electrical energy therefrom; first electrical heating means connected through first connecting

circuitry to said temperature controller means, said first electrical heating means disposed in a first heating chamber means which is coupled to said pump means to receive said relatively constant stream of fluid therefrom to enable said first electrical heating means to heat said stream of fluid to a first temperature, said first electrical heating means formed and disposed to act as a sensor whereby said temperature controller includes means responsive to changes in electrical resistance in said first electrical heating means; second electrical heating means disposed in a second heating chamber, which second heating chamber



is coupled to said first heating chamber to receive said stream of fluid therefrom and whereby second electrical heating means heats said stream of fluid to a higher temperature than said first temperature; interface circuitry means connected to said first connecting circuitry and disposed to connect said power source to said second electrical heating means, said interface circuitry formed such that as the electrical current to said first electrical heating means varies, said interface circuitry will cause said power source to provide a related variation in current directly to said second heating means.

4,604,517

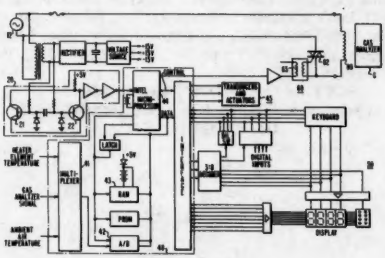
PULSE FREQUENCY MODULATION CONTROL FOR A HEATER

Michael N. Barry, Cork, Ireland, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 521,206, Aug. 8, 1983, abandoned. This application May 20, 1985, Ser. No. 736,406

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—494 **3 Claims**



1. A heater control system for maintaining a predetermined temperature of a solid electrolyte electrochemical cell of a gas analyzer essentially constant, comprising:

an AC power source;

a heater element operatively coupled to said solid electrolyte electrochemical cell of said gas analyzer,

a control circuit means coupling said AC power source to said heater element, said control circuit means including, a zero crossing detector circuit means for developing output logic levels indicative of the zero crossing of the AC cycles of said AC power source, a microcomputer means including a software program which implements a real time counter which is preset with the number of AC cycles to be controlled during a modulation period, the logic outputs of said zero crossing detector circuit means decrementing the counter, said microcomputer means including a multiplexer which generates signals indicative of at least said heater elements temperature, ambient temperature and gas analysis signal, said microcomputer means responding to the counter and the signals generated by said multiplexer in order to select the AC cycles within which AC power is applied to said heater element during the modulation period and generating a uniform output pulse pattern corresponding to an integral number of AC cycles to maintain the predetermined heater temperature essentially constant; and

a trigger circuit means responsive to the output pulse pattern of said microcomputer means to dispatch uniformly the integral number of AC cycles of said AC power source to said heater element over the modulation period wherein the AC power applied to said heater element is characterized by a low ripple content and minimal radio frequency interference.

4,604,518

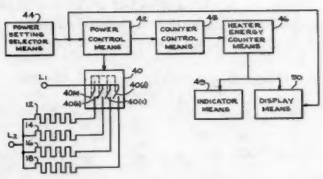
DISPLAY ARRANGEMENT FOR COOKING APPLIANCE WITH POWER CONTROL USING HEATER ENERGY COUNTER

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 16, 1984, Ser. No. 672,300

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—506 **2 Claims**



1. An arrangement for monitoring and displaying the approximate temperature of a resistive heating element adapted for selective energization by a power signal from an external power supply at one of a plurality of power levels in response to selection by an operator of one of a plurality of power settings ranging from relatively low power settings, including an OFF setting, to relatively high power settings and displaying to the user that the element has reached the steady state power level associated with the selected power setting; the heating element having a temperature response characterized by a transient heat-up phase followed by a steady state phase when the power setting is changed from OFF to some power setting; and by a transient cool-down phase when the power setting is changed from a relatively higher power setting to a relatively lower power setting, the monitor and display arrangement comprising:

energy counter means for approximately tracking the heating element temperature;

counter control means operative to selectively increment said energy counter means at an increment rate which is approximately proportional to the rate of increase of the heating element temperature during the heat-up phase when operated at the selected power level, and to discontinue incrementing said energy counter means when said count at least equals a predetermined maximum count which is approximately proportional to the steady state heating element temperature for the selected power setting; said counter control means being further operative to decrement said energy counter means when the power setting selection is changed from a relatively higher power setting to a relatively lower power setting at a decrement rate which is approximately proportional to

the rate of decrease of the heating element temperature during its cool-down phase, and to discontinue decrementing said energy counter means when said count is less than a predetermined maximum count which is approximately proportional to the steady state operating temperature of the heating element at the selected relatively lower power setting; and

display means responsive to said counter control means operative to signify to the user that said count of said energy counter is closely approaching said predetermined maximum count for the selected power setting;

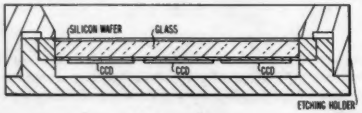
said display means comprising an array of display segmensts adapted to be selectively energized to form a plurality of patterns, each pattern representing a corresponding power setting, and circuit means for selectively energizing said display segments in that one of said plurality of patterns corresponding to the selected power setting, and means for intermittently interrupting energization of said display segments thereby creating a blinking effect during a period of predetermined duration, said period being initiated upon the occurrence of a predetermined count of said counter means, which count is a function of said predetermined maximum count for the selected power setting whereby blinking of said segments of said display means indicates to the user that the heating element has reached its steady state temperature for the selected power setting.

4,604,519

INTENSIFIED CHARGE COUPLED IMAGE SENSOR HAVING AN IMPROVED CCD SUPPORT

James A. Zollman; William M. Kramer, and James L. Rhoads, all of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed May 13, 1983, Ser. No. 494,288
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—213 VT **16 Claims**



1. In an intensified charge coupled image sensor of the type comprising:

an image intensifier tube including an evacuated envelope having therein a photoemissive cathode for emitting electrons in a pattern corresponding to the intensity of radiation incident thereon, a header assembly including a header member, a charge coupled device spaced from said cathode, said device having a first surface and a second surface, and support means for supporting said device within said header member, wherein the improvement comprises

said charge coupled device having a conductive boundary on said first surface, said support means comprising a discrete frame member having a coefficient of expansion identical to that of the charge coupled device, said frame member having a first and a second major surface with a conductive pattern on one of said major surfaces in register with the conductive boundry of said charge coupled device, said frame member being disposed between said cathode and said charge coupled device and having an aperture therein to permit the electrons from said cathode to impinge upon said charge coupled device, and

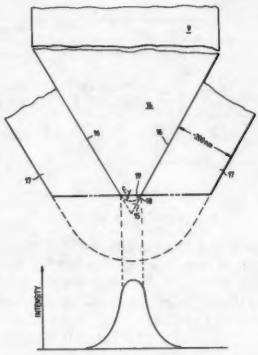
bonding means for securing said conductive pattern of said frame member to said conductive boundary of said charge coupled device, thereby attaching said frame member to said charge coupled device to strengthen and support said charge coupled device.

4,604,520

OPTICAL NEAR-FIELD SCANNING MICROSCOPE

Wolfgang D. Pohl, Adliswil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1983, Ser. No. 563,722
Claims priority, application European Pat. Off., Dec. 27, 1982, 82111974.0
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—216 **9 Claims**



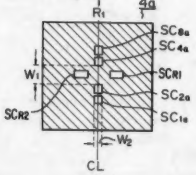
1. An optical near-field scanning microscope comprising an aperture with arrangements for mutual scanning displacement between said aperture and an object to be viewed to provide a controllable distance therebetween, a photodetector optically connected to said aperture, and a light source, characterized in that said aperture consists of a transparent body covered with an opaque layer through which an opening is formed, the diameter of said opening being less than the wavelength of the light used for illuminating the object to be viewed.

4,604,521

OPTICAL ABSOLUTE ENCODER

Yoshitaka Takekoshi, Hachioji, and Shigeyuki Ushiyama, Hino, both of Japan, assignors to Fanuc Limited, Hino, Japan

PCT No. PCT/JP83/00362, § 371 Date Jun. 18, 1984, § 102(e) Date Jun. 18, 1984, PCT Pub. No. WO84/01651, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 18, 1983, Ser. No. 624,504
Claims priority, application Japan, Oct. 18, 1982, 57-181471
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **6 Claims**



1. An optical absolute encoder provided with:

a light emitting element;

a rotary code plate having a plurality of concentric code patterns with light passage portions, for passing light from said light emitting element, and light blocking portions alternately arranged on the same circle and having a reference pattern comprised of just a light passage portion arranged concentrically with said code patterns;

a fixed plate provided with light passage slits provided corresponding to said code patterns and reference pattern of said rotary code plate; and

light receiving elements for receiving light from said light emitting element passing through the light passage portions of said rotary code plate and the light passage portions of said fixed plate;

the optical absolute encoder being characterized in that:

said reference pattern included on said rotary code plate is arranged sandwiched between two adjoining code patterns and in that

said fixed plate is provided with:

first and second code pattern slit groups arranged at first predetermined intervals and in correspondence with said code patterns in the radial direction of said rotary code plate and

reference pattern light passage portions arranged at positions corresponding to said reference pattern at positions separated by exactly second predetermined intervals from the center line of said code pattern light groups.

4,604,522

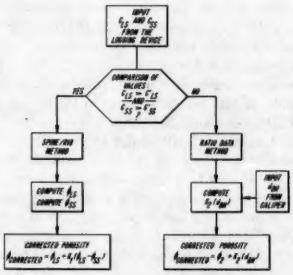
METHOD AND APPARATUS FOR LOGGING A BOREHOLE EMPLOYING DUAL RADIATION DETECTORS

Dan M. Arnold, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 5, 1984, Ser. No. 668,530

Int. Cl.[4] G01V *5/08, 5/10*

U.S. Cl. 250—264 **20 Claims**



1. An apparatus for logging a characteristic of a borehole in an earth formation employing nuclear count rate data selectively compensated for non-standard borehole conditions, comprising:

a sonde, moveable in a borehole, having:

a radiation source for emitting radiation into earth formations adjacent the wellbore;

first detector, spaced longitudinally from the radiation source, for detecting radiation scattered back to the detector and generating a first signal representative of a first count rate value, C_{SS}; and

second detector spaced a different longitudinal distance from the radiation source, for detecting radiation scattered back to the detector and generating a second signal representative of a second count rate value, C_{LS};

memory means for storing a predetermined threshold value, first predetermined relationships between the borehole characteristic and count rate values C_{LS}, C_{SS}; and second predetermined relationships between the borehole characteristic and ratios of C_{LS} to C_{SS};

electronic means for producing a signal related in value to the borehole characteristic, which electronic means compares at least one of said first and second count rate value signals with the predetermined threshold value, determines when said one count rate value exceeds said threshold, and, in response thereto, produces a first signal representative in value of the borehole characteristic compensated for non-standard borehole conditions according to the first predetermined relationship; said electronic means also determining when said one count rate value is less than said threshold, and, in response thereto, producing a second signal representative in value of the borehole characteristic according to the second predetermined relationship; and

means for recording the signal generated by the electronic means.

4,604,523

SCANNABLE-BEAM MICROSCOPES AND IMAGE STORES THEREFOR

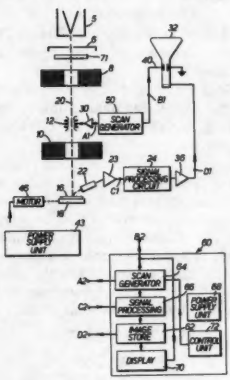
William R. Knowles, Newmarket, and Ian A. Cruttwell, Great Chishall, Nr. Royston, both of England, assignors to Cambridge Instruments Limited, Cambridge, England

Filed Jan. 12, 1984, Ser. No. 570,083

Claims priority, application United Kingdom, Jan. 15, 1983, 8301096

Int. Cl.[4] G01N *23/00*

U.S. Cl. 250—310 **10 Claims**



1. A microscope arrangement having a movable energy probe and a scannable display means for displaying electrical signals derived from the interaction between a specimen and the probe as it moves over the specimen, in which

the scanning rate of the display means and the mode of movement of the probe over the specimen are fixed and asynchronous with, different from and independent of each other,

the mode of movement of the energy probe is a mode in which the probe is directed to each of a plurality of substantially randomly arranged positions on the specimen, and

including storage means which forms an integral part of the microscope arrangement and is for temporarily storing the signals derived from the specimen before they are displayed by the display means.

4,604,524

PASSIVE INFRA-RED SENSOR

Yaacov Kotlicki, 20 Yoav Street, Ramat Gan, and Moshe Kotlicki, 24 Weisburg Street, Tel Aviv, both of Israel

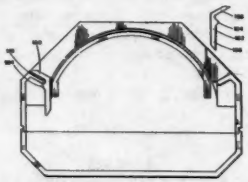
Filed Oct. 11, 1984, Ser. No. 659,945

Int. Cl.[4] G01J *5/04*

U.S. Cl. 250—342 **17 Claims**

1. A passive infra-red sensor comprising:

a housing including a mounting base and a lens mounting cover element;
detector support means;
an infrared detector mounted on the detector support means; and



a lens arranged for optical coupling to the infrared detector; and
lens mounting and locking retaining means arranged for snap fit engagement with said cover element, and which once inserted, can be removed only from the inside of the cover element and not from the outside thereof.

4,604,525

RADIATION IMAGE STORAGE PANEL WITH DISPERSING AGENT

Akira Kitada; Kikuo Yamazaki, and Hisashi Yamazaki, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 2, 1985, Ser. No. 751,122
Claims priority, application Japan, Jul. 4, 1984, 59-138831
Int. Cl.[4] H05B *33/00*; G01T *1/20*; C09K *11/02, 11/08*
U.S. Cl. 250—363 R **9 Claims**

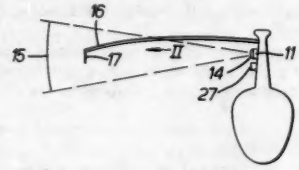
1. A radiation image storage panel comprising a support and a phosphor layer which comprises a binder and a stimulable phosphor dispersed therein and is colored with a colorant, characterized in that said colorant is a pigment capable of absorbing a portion of stimulating rays for the stimulable phosphor and said phosphor layer contains a dispersing agent of at least one fatty acid ester selected from the group consisting of sorbitan fatty acid esters, polyoxyethylene sorbitan fatty acid esters and polyoxyethylene fatty acid esters.

4,604,526

POSITION DETECTOR

Christopher I. Moir, Malvern Link, England, assignor to Micro Control Technology Limited, Great Britain

Filed Nov. 9, 1983, Ser. No. 550,479
Claims priority, application United Kingdom, Nov. 10, 1982, 8232096
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—561 **10 Claims**



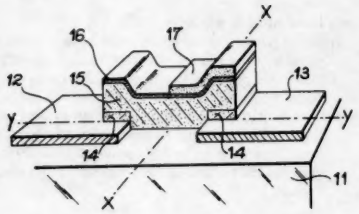
1. A position detector comprising means defining an elongate field of view, for viewing a target which is arranged to cross the field of view in any of a range of positions along the length of the field of view and having a reference part, a sensor in the form of a line of sensitive elements extending parallel with the field of view and positioned to receive an image of the field of view, and electronic means for repeatedly scanning the elements in scanning cycles and for detecting the particular sensitive element which receives the image of the reference part of the target as the target crosses the field of view.

4,604,527

APPARATUS FOR POINT-BY-POINT READING OF DOCUMENTS USING PHOTODETECTOR MATRIX

André Chenevas-Paule, Grenoble, and Robert Cuchet, Clelles, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 10, 1983, Ser. No. 550,769
Claims priority, application France, Nov. 17, 1982, 82 19229
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—578 **5 Claims**



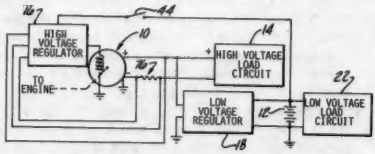
1. In an apparatus for the point-by-point reading of a document including:
(a) a matrix of photodetector elements, said matrix comprising p groups of q basic elements aligned along a first axis, each of said basic elements having an input terminal and an output terminal;
(b) a circuit having p connections, each of said connections being connected to the input terminal of each of the q basic elements in a corresponding one of said p groups; and
(c) an output circuit having q connections, each of said connections being connected to the output terminal of each of the basic elements occupying a corresponding position within said p groups,
each of said basic elements comprising a photodiode and an associated diode which is insensitive to light radiation, said photodiodes and associated diodes each having a first electrode of one polarity and a second electrode of opposite polarity, said first electrode of each photodiode being connected to said first electrode of said associated diode, said second electrode of each photodiode serving as the output terminal of a corresponding one of said basic elements, and said second electrode of each associated diode serving as the input terminal of said corresponding one of said basic elements, said circuit comprising a shift register for supplying a polarization voltage pulse to each of said p connections in sequence in order to render the basic elements connected thereto conductive, the improvement wherein in each basic element the arrangement of layers of material in the interelectrode space of said photodiode is the same as the arrangement of layers of material in the interelectrode space of said associated diode.

4,604,528

DUAL VOLTAGE POWER SUPPLY SYSTEM FOR VEHICLES

Peter Norton, 2730 Narraganset, Lansing, Mich. 48910

Filed Jan. 10, 1984, Ser. No. 569,723
Int. Cl.[4] H02P *9/30*
U.S. Cl. 307—10 R **12 Claims**



1. In an electrical system for a vehicle, said system being of

the type including a DC generator having a DC output, a storage battery adapted to be charged from the generator, said generator having a field winding of controlled energization, a first load circuit including said storage battery and one or more load devices designed to be powered by electricity at a voltage in a first voltage range corresponding to the rated voltage of the battery, and a second load circuit including one or more load devices designed to be powered by electricity at a voltage in a second voltage range substantially higher than the rated voltage of said battery, the improvement comprising:

a first regulator having a power input coupled with the DC output of said DC generator and having an output coupled with said first load circuit, said first regulator including means for converting DC electrical power applied to said power input to an output voltage meeting the requirements of said first load circuit,

a second regulator responsive to DC voltage derived from said DC output and coupled with the field winding of said generator for controlling said generator to produce an output voltage meeting the requirements of said second load circuit,

the output of said generator being coupled with said second load circuit.

4,604,529

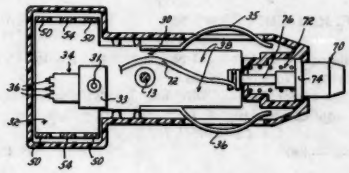
RADAR WARNING RECEIVER WITH POWER PLUG

Richrd L. Grimsley, Cincinnati, and Gregory R. Furnish, Mason, both of Ohio, assignors to Cincinnati Microwave, Inc., Cincinnnati, Ohio

Filed Sep. 28, 1984, Ser. No. 656,157

Int. Cl.[4] H02J *1/00*; H01R *3/00*

U.S. Cl. 307—10 R **12 Claims**



1. In combination:

a radar warning receiver;

a plug adapted to be received within a vehicle cigarette lighter socket;

a power cord interconnecting said radar warning receiver and said plug;

said plug comprising a plastic housing having a forward tubular end the circumference of which is sized to permit said tubular end to be slidably received in said vehicle cigarette lighter socket and further having a rearward handle grip end sized to conveniently be gripped between the thumb and fingers of a human hand;

an elongated metal plate having a forward end being contained substantially within said housing tubular end;

a pair of outwardly bowed resilient spring arms formed integral to the forward end of said plate, said arms projecting exteriorly of said forward tubular end of said housing;

power regulator means being a source of thermal energy and mounted in electrical and thermally conductive contact with said plate for providing regulated energy to said radar warning receiver via said power cord from the vehicle electrical system when said plug is received in said vehicle cigarette lighter socket;

said arms (1) being adapted to releasably retain said tubular end in said socket, (2) providing an electrical path between said vehicle electrical system and said power regulator means, and (3) providing a thermally conductive path between said vehicle and said power regulator means whereby said vehicle becomes a heat sink for said power regulator means.

4,604,530

POWER SUPPLY EQUIPMENT BACKUP SYSTEM FOR INTERRUPTION OF SERVICE

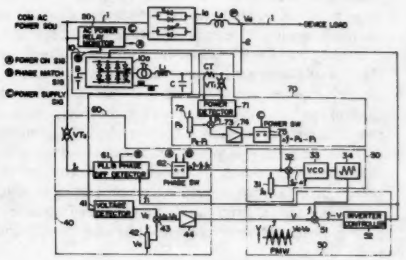
Tadao Shibuya, Numazu, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 641,000

Claims priority, application Japan, Aug. 16, 1983, 58-149482; Aug. 29, 1983, 58-157482

Int. Cl.[4] H02J *9/00*

U.S. Cl. 307—66 **15 Claims**



1. A power supply equipment backup system for interruption of service for supplying power from a commercial AC power source to a device load through a main power supply line (1) and from a battery DC source (B) to the device load through an auxiliary power supply line (2) connected in parallel with the main power supply line in relation to ground, which comprises:

(a) an AC switch (1*a*) connected to the commercial AC power source;

(b) a commercial AC power source mointoring means (20) connected to the commercial AC power source for outputting a power-on signal A to said AC switch (1*a*) for activating said AC switch (1*a*) to supply the commercial AC power source to the device load through the main power supply line when the commercial AC power source changes to a normal condition;

(c) power inverter means (10) having an inductor (L_i) and connected between the battery DC power source (B) and the device load for supplying an inverter power source to the device load through the auxiliary power supply line whenever the commercial AC power source is abnormal or normal;

(d) basic inverter frequency presetting means (30) for outputting a triangular wave signal to determine an inverter frequency substantially equal to said commercial AC power source frequency on the basis of a preset inverter frequency value (fo);

(e) basic inverter voltage presetting means (40) connected to an output terminal of said inverter means (10) for outputting a DC voltage signal to determine an inverter voltage substantially equal to said commercial AC power source voltage on the basis of a preset inverter voltage value (V_o);

(f) inverter controlling means (50) connected to said inverter frequency presetting means (30) and said inverter voltage presetting means (40) for comparing the triangular wave signal with the DC voltage signal in voltage level and for outputting inverter control signals to said inverter means (10), inverter frequency being determined by the triangular wave signal frequency, and further inverter voltage being determined by time intervals during which the triangular wave signal exceeds the DC voltage signal in voltage level,

(g) a main power supply line inductor (L_l) connected between said AC switch (1*a*) and the device load with an output terminal of said inverter means (10) connected to a

junction point between said inductor (L_i) and the device load;

(h) phase matching means (60) including phase difference detecting means connected between the commercial AC power source and said basic inverter frequency presetting means (30) and connected by a feedback loop from said inverter controlling means (50), said phase matching means detecting a phase difference between the commercial AC power source and the inverter power source, outputting a phase difference signal to said basic inverter frequency presetting means (30) to adjust the inverter power source frquency (fi) to the commercial AC power source frequency (fc), and outputting a phase match signal B to said commercial AC power source monitoring means (20) for allowing said monitoring means (20) to output a power-supply signal C to said AC switch (1a) to supply the commercial AC power source to the device load when the inverter power source has matched the commercial AC power source in phase, said phase matching means (60) being connected to said basic inverter frequency presetting means (30) in response to the power-on signal A and disconnected from said basic inverter frequency presetting means (30) in response to the phase match signal B; and

(i) a battery charging power presetting means (70) connected between the output terminal of said inverter means (10) and said basic inverter frequency presetting means (30), said battery charging power presetting means (70) reducing inverter frequency (fi) to supply a battery charging power from the main power supply line (1) to the auxiliary power supply line (2) by passing a charging current from the commercial AC power source to the battery through said inverter means (10) in dependence upon a small phase difference between the commercial AC power source and the inverter power source caused by a small frequency difference between the two, said battery charging power presetting means (70) being connected to said basic inverter frequency presetting means (30) in response to the power-supply signal C outputted from said commercial AC power source monitoring means (20) when the commercial AC power source changes to the normal condition.

4,604,531

IMBALANCE CIRCUITS FOR DC TESTING

John E. Gersbach, Burlington, and John J. Moser, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1983, Ser. No. 517,140

Int. Cl.[4] H03K *19/20, 5/08*

U.S. Cl. 307—445 **4 Claims**

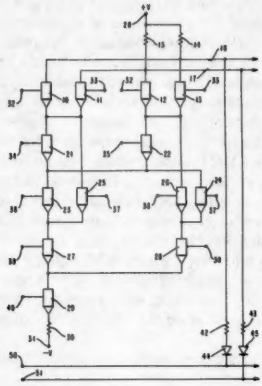
1. A logic circuit array comprising;

a plurality of logic circuits coupled to a pair of output lines and to a first voltage source,

each of said logic circuits comprising a plurality of emitter coupled transistors, arranged in a cascode configuration and coupled between said pair of output lines and a second voltage source,

a first impedance means coupled between said first voltage source and one of said pair of said output lines,

a second impedance means coupled between said first voltage source and the other of said pair of output lines, and



an imbalance voltage means connected to at least one of said output lines via a third impedance means for imbalancing at least one of said output lines.

4,604,532

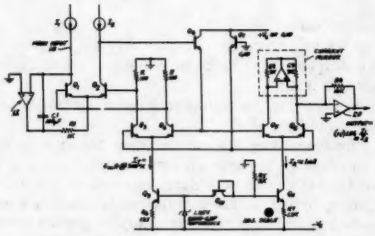
TEMPERATURE COMPENSATED LOGARITHMIC CIRCUIT

Barrie Gilbert, Forest Grove, Oreg., assignor to Analog Devices, Incorporated, Norwood, Mass.

Continuation of Ser. No. 455,240, Jan. 3, 1983, abandoned. This application Jan. 24, 1985, Ser. No. 694,462

Int. Cl.[4] G06G *7/12, 7/24*

U.S. Cl. 307—490 **18 Claims**



1. A log circuit for producing an output signal proportional to the logarithm of an input signal and free from temperature induced variations, comprising:

input means responsive to said input signal and including means to develop a first signal proportional to the product of (1) the logarithm of said input signal and (2) absolute temperature;

circuit means including a PTAT (proportional-to-absolute-temperature) source producing a second signal and coupled to said input means;

said circuit means further including means for modulating the magnitude of said second signal in accordance with said logarithm while effecting cancellation of the temperature-related factors of said two signals; and

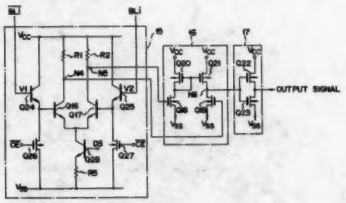
output means for developing an output signal corresponding to said modulation of said second signal.

4,604,533

SENSE AMPLIFIER

Junichi Miyamoto, and Shinji Saito, Both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 20, 1983, Ser. No. 563,501
Claims priority, application Japan, Dec. 28, 1982, 57-233564; Apr. 20, 1983, 58-76459
Int. Cl.[4] H03K 5/24; G11C 7/06
U.S. Cl. 307—530 10 Claims



5. A sense amplifier responsive to a chip enable signal and coupled to a plurality of MOS transistor type memory cells each providing a different differential signal and to first and second power supplies, said sense amplifier comprising:

first and second bipolar transistors having current paths connected at a first end to said first power supply and having bases coupled to receive a differential signal from one of said memory cells;

first and second MOS transistors each having a current path coupled at a first end to said second power supply and at a second end to a second end of a different one of said first and second bipolar transistor current paths, said first and second MOS transistors each having a gate coupled to said chip enable signal for controlling the conductivity state of said first and second MOS transistors;

third and fourth bipolar fransistors each being connected to a different one of said first and second bipolar transistors in a Darlington pair configuration, said third and fourth bipolar transistors having current paths connected together at first ends;

first and second load elements each connected between said first power supply and a second end of a different one of said third and fourth bipolar transistor current paths;

a constant current source connected between said first ends of said third and fourth bipolar transistor current paths and said second power supply;

third and fourth MOS transistors each having a gate coupled to said second end of a different one of said third and fourth bipolar transistor current paths, said third and fourth MOS transistors each having a current path with a first end connected to said second power supply; and

a current mirror circuit formed of MOS transistors and connected between a second end of said current paths of said third and fourth transistors and said second power supply, thereby supplying said third and fourth MOS transistors with a constant current, and said mirror circuit receiving a signal from said second end of said third MOS transistor current paths.

4,604,534

HIGHLY SENSITIVE HIGH PERFORMANCE SENSE AMPLIFIERS

Wilbur D. Pricer, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

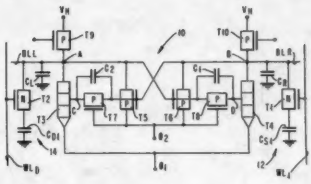
Filed Dec. 3, 1984, Ser. No. 677,613
Int. Cl.[4] H03K 5/24, 3/287, 3/356; G11C 7/06
U.S. Cl. 307—530 23 Claims

1. A sense amplifier comprising;

first and second nodes,

input/output means coupled to said nodes,

a pair of cross-coupled bipolar transistors arranged as a regenerative latch coupled at their control electrodes between said nodes,



a pair of cross-coupled field effect transistors arranged as regenerative latch coupled at their control electrodes between said nodes, and

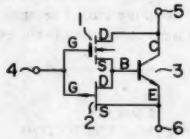
means for coupling a supply voltage to said transistors.

4,604,535

FET-BIPOLAR SWITCHING DEVICE AND CIRCUIT

Takao Sasayama, Hitachi; Kazuo Kato, Ibaraki, and Masayoshi Naito, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 10, 1982, Ser. No. 376,575
Claims priority, application Japan, May 13, 1981, 56-70803
Int. Cl.[4] H03K 17/04, 17/60, 17/687
U.S. Cl. 307—570 8 Claims



1. A switching device comprising a MOS FET, a depletion type FET and a bipolar transistor, a source of the MOS FET being connected to a drain of the depletion type FET with the connecting junction connected to a base of the bipolar transistor, a drain of the MOS FET being connected to a collector of the bipolar transistor and a source of the depletion type FET being connected to an emitter of the bipolar transistor, the collector-emitter conduction or non-conduction of said bipolar transistor being controlled by an input signal applied to gates of the MOS FET and depletion type FET connected in common.

4,604,536

TIMING CIRCUITS

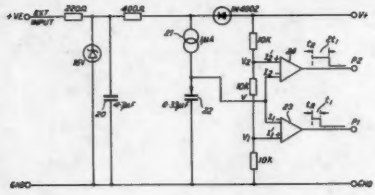
Richard C. D. Clutterbuck, Cobham, and Anthony R. Painton, Slough, both of England, assignors to EMI Limited, Hayes, England

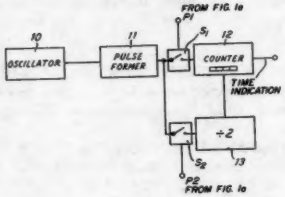
Filed Mar. 8, 1984, Ser. No. 587,537
Claims priority, application United Kingdom, Mar. 9, 1983, 8306483
Int. Cl.[4] H03K 17/28, 21/02
U.S. Cl. 307—603 6 Claims

1. A timing circuit comprising,

a control circuit including a first pulse generating means for generating a first control pulse on expiry of a first delay, of preset duration, measured from reception of an external pulse, and a second pulse generating means for generating a second control pulse on expiry of a second delay, of preset duration, measured from the end of said first delay; and a clock circuit including means for generating clock pulses and counting means, responsive to said first and second control pulses, to count said clock pulses respec-

tively at a first rate and a second rate, $1/(r+1)$ times the first rate, where r is the ratio of said first delay to said





second delay, whereby after said second delay the count produced by said counting circuit represents the elapsed time as measured from reception of said external pulse.

4,604,537

AC TACHO-GENERATOR

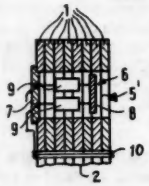
Hans-Dieter Layh, Zachersweg 17, D-7121 Gemmrigheim, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,135

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332533

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—68 R **5 Claims**



1. An AC tacho-generator comprising a multiple pole stator with pole windings, said stator consisting of a magnetically interconnected pack of stacked, congruent steel laminae, each lamina defining an annular yoke portion; a plurality of poles projecting radially inwardly from the yoke portion, and an opening formed in each yoke portion, the openings of the yoke portions, in the pack forming a cut-out extending through the stator from endface to endface thereof; and electronic circuitry arranged in the cut-out, said circuitry including circuit elements coupled to said pole windings, a first supporting plate secured at one end of the cut-out and a second supporting plate movably arranged inside the cut-out, the second supporting plate being mounted on the first supporting plate by means of said circuit elements to neutralize thermal expansion of the latter.

4,604,538

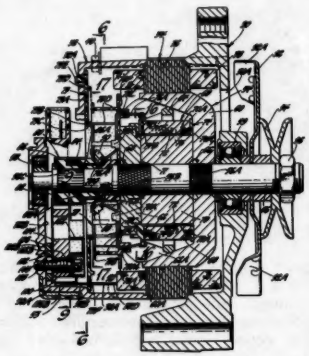
AIR COOLING FOR DIODE-RECTIFIED ALTERNATING CURRENT GENERATORS

Thomas A. Merrill, Anderson, and Donald A. Martin, Markleville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 19, 1985, Ser. No. 703,123

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—68 D **5 Claims**



1. An air cooled diode-rectified alternating current generator comprising, first and second metallic end frames, a stator core supported by said end frames disposed within said generator carrying a stator winding, a rotor for said generator having a rotor shaft supported for rotation by said end frames, a bridge rectifier comprised of a plurality of diodes mounted respectively on first and second metallic heat sinks, said diodes being electrically connected to said stator winding, said first heat sink mounted in direct metal-to-metal contact with an inner surface of said first end frame, a first cooling fan driven by said rotor shaft and located within said first end frame, a second cooling fan secured to said rotor shaft and located adjacent an outer surface of said second end frame, a first cooling path for causing cooling air impelled by said first fan to contact said second heat sink and one end of said stator winding located adjacent said first fan, said first cooling path comprising air inlet openings formed in said first end frame, said first fan and air outlet openings formed in an outer circumferentially extending wall of said first end frame that are located adjacent said one end of said stator winding, a second cooling path for causing cooling air impelled by said second fan to contact an opposite end of said stator winding, said second cooling path comprising air inlet openings formed in said second end frame that are disposed adjacent said opposite end of said stator winding and air outlet openings formed in an end wall of said second end frame and aligned with said second fan, said second fan causing some flow of air through said generator from the said air inlet openings formed in said first end frame to the air outlet openings formed in said second end frame.

4,604,539

DRIVE MECHANISM WITH A ROTARY DRIVE MOTOR

Leo Bertram, Stolberg, Fed. Rep. of Germany, and Romuald L. Bukoschek, Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1985, Ser. No. 734,419

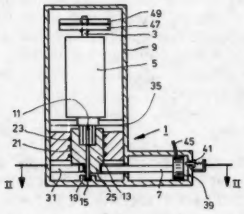
Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419177

Int. Cl.[4] H02K *7/06*

U.S. Cl. 310—80 **6 Claims**

1. A drive mechanism comprising a mains-powered rotary drive motor, for converting the rotary movement of the drive

shaft into a pulsating axial movement by means of an eccentric cam, in particular for driving a pump-piston, characterized by a cylindrical body (13), which is force-coupled to the motor shaft (3) of a single-phase synchronous motor (5), which is coaxial with the motor shaft (3), and which co-operates with a piston rod (7) with its eccentric cam (25), and which drive-



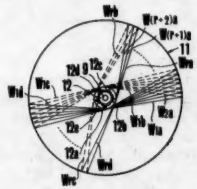
shaft system is supported in a multiple bearing arrangement, which comprises a broad-area bearing (23) for the circumferential surface (21) of the cylindrical body (13) and a shaft bearing (19) for a shaft end (15) which projects from the cylindrical body (13) at the end surface which is remote from the motor.

4,604,540

CORELESS MOTOR, AND A METHOD FOR MANUFACTURING THE CORELESS MOTOR

Tadashi Fukami, Sagamihara, Japan, assignor to Oken Seiko Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1981, Ser. No. 233,817
Claims priority, application Japan, Feb. 18, 1980, 55-18818
Int. Cl.⁴ H02K *21/26*
U.S. Cl. 310—154 **8 Claims**



1. A coreless motor which comprises:

an air-core disc shaped rotor winding comprising a plurality of conductive loops formed from an insulation coated conductor, each said loop extending in the radial direction from a point on the circumference of said winding through the vicinity of the center of said winding to a substantially diametrically opposed point on said circumference, downward along the edge of said circumference to the lower face of said winding, along the radial direction on the lower face of said winding from a point on the circumference thereof, through the vicinity of said center to a substantially diametrically opposed point on said circumference, upward along the edge of said circumference to the upper face of said winding, each said loop being displaced from the preceding loop in the tangential direction of said winding;

a disc shaped yoke formed of magnetic material housed in said rotor winding with a gap therebetween; and

a permanent magnet disposed in a position opposing the plane portion of said rotor winding and having a magnetic pole means for providing magnetic flux which is alternately reversed in the direction of the axis of said winding in regions of said winding lying on opposite sides of the center of said plane portion,

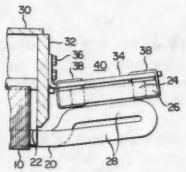
said yoke and said permanent magnet means being fixed relative to each other, and said rotor winding being freely rotatable with respect to said yoke and said permanent magnet means.

4,604,541

SPLIT STATOR ARMATURE WINDING

Shigeru Murasato; Yuji Nakanishi; Kenzou Fujiwara; Norio Takeuchi, and Tsuyoshi Horita, all of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1985, Ser. No. 691,537
Claims priority, application Japan, Jan. 17, 1984, 59-6676
Int. Cl.⁴ H02K *1/00, 3/00, 19/26, 21/00*
U.S. Cl. 310—180 **4 Claims**



1. A split stator armature winding comprising

a circumferentially split stator core having slots formed therein;

a plurality of armature coils mounted in a single layer in said slots without bridging the splitting interface of said split stator; and

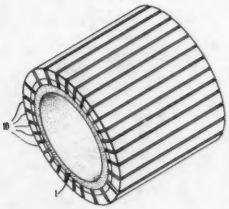
a closed-loop dummy coil disposed so as to bridge said splitting interface of said split stator and in the vicinity of the back portion of the coil ends of said armature coils close to said splitting interface of said split stator.

4,604,542

BROADBAND RADIAL VIBRATOR TRANSDUCER WITH MULTIPLE RESONANT FREQUENCIES

Stephen C. Thompson, Euclid, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jul. 25, 1984, Ser. No. 634,073
Int. Cl.⁴ H01L *41/08*
U.S. Cl. 310—334 **15 Claims**



1. A transducer, comprising:

a radial electromechanical transducer element having a radiating surface on an outer circumference of said radial electromechanical transducer element; and

at least two mechanically resonant sections coupled to the radiating surface of said radial electromechanical transducer element and each mechanically resonant section having a laminar structure.

4,604,543

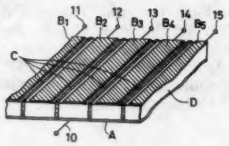
MULTI-ELEMENT ULTRASONIC TRANSDUCER

Shinichiro Umemura, Hachiouji; Hiroshi Takeuchi, Matsudo; Kageyoshi Katakura, Meguro, and Ryuichi Shinomura, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,314

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 **18 Claims**



1. A multi-element ultrasonic transducer for at least one of transmission and reception of sound waves comprising:

a piezoelectric material having a plate or sheet shape;

a first electrode formed on a first face of said piezoelectric material;

a plurality of second electrodes formed on a second face of said piezoelectric material opposite to said first face such that they are separated from one another in a manner to correspond to the plural elements of said transducer; and

a plurality of third electrodes formed on the second face of said piezoelectric material and in the gaps between said second electrodes,

wherein said first electrode and said third electrodes are used as a common electrode whereas said second electrodes are used as the signal electrodes for said elements, respectively.

4,604,544

PIEZOELECTRIC PRESSURE INDICATOR

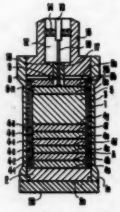
Toshiaki Konomi, Susono; Koji Ito, Gotenba; Yukihiro Nagahori, Kitaadachi, and Akio Ito, Kounosu, all of Japan, assignors to Jeco Co., Ltd., Kanagawa and Toyota Jidosha Kabushiki Kaisha, Aichi, both of, Japan

Filed Oct. 16, 1984, Ser. No. 661,542

Claims priority, application Japan, Oct. 17, 1983, 58-193904; Oct. 17, 1983, 58-160487[U]; Oct. 17, 1983, 58-160488[U]; Oct. 17, 1983, 58-160489[U]

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—338 **3 Claims**



1. In a piezoelectric pressure indicator comprising a casing, a pressure receiving member at a bottom of said casing, piezoelectric element means mounted on said pressure receiving member for producing an electric voltage corresponding to a pressure applied to said pressure receiving member, an acceleration compensating weight and acceleration compensating piezoelectric element means, said first mentioned piezoelectric element means and said acceleration compensating piezoelectric element means being electrically connected such that voltages produced by said piezoelectric element means cancel with each other, thereby compensating for an effect of acceleration, the improvement wherein said acceleration compensating piezoelectric element means comprises an uppermost perforated element and an imperforate element thereunder, a lead wire for deriving the electric voltage connected to an electrode of said imperforate element to extend through a perforation of said perforated element, an output voltage deriving means having a bushing inserted into an upper end of said casing, and a terminal connected to said lead wire through a central opening of said bushing, said bushing having at its bottom surface a plurality of radial grooves in communication with the central opening.

4,604,545

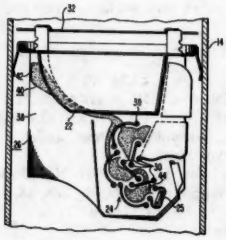
PHOTOMULTIPLIER TUBE HAVING A HIGH RESISTANCE DYNODE SUPPORT SPACER ANTI-HYSTERESIS PATTERN

Arthur F. McDonie, and Richard D. Faulkner, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 28, 1980, Ser. No. 172,659

Int. Cl.[4] H01J *43/00*

U.S. Cl. 313—105 CM **10 Claims**



1. A photomultipler tube comprising:

an evacuated envelope;

a photocathode within said envelope;

an anode spaced from said photocathode;

a plurality of spaced apart dynodes for propagating and concatenating electron emission from said photocathode to said anode;

a pair of substantially parallel support spacers of insulating material to support said dynodes and said anode;

a coating disposed on said support spacers and overlying an interelectrode region extending along a concatenating path of said electron emission from said dynodes to said anode, said coating having a resistance of greater than about 10^6 ohms per square but less than 10^{12} ohms per square.

4,604,546

INCANDESCENT LAMP MOUNT STRUCTURE WITH SHIELD FOR EVAPORATION PRODUCTS

David H. Fox, Beverly, Mass., and Lonnie Robinson, Baskin Ridge, N.J., assignors to GTE Products Corporation, Danvers, Mass.

Filed Jul. 3, 1984, Ser. No. 627,397

Int. Cl.[4] H01J *1/88*

U.S. Cl. 313—272 **18 Claims**

1. An electric lamp for operation in either a "base down" or "base up" orientation, comprising:

(a) a light transparent glass envelope affixed to a lamp base,

(b) a stem means extending from said lamp base within said envelope,

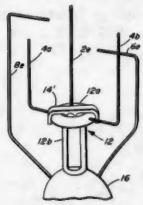
(c) a pair of resistive filaments within said envelope,

(d) lead-in wires extending from the lamp base and said stem means and connected to said filaments,

(e) an arbor supported by said stem means within said envelope,

(f) filament support wires supported by said arbor and connected between said arbor and said filaments,

(g) shield means disposed intermediate said filaments and



said arbor to shield said arbor from filament evaporation products produced when said lamp is operated and which would otherwise deposit on said arbor when said lamp is operated in the "base up" orientation.

4,604,547

DEFLECTION SYSTEM FOR A TWO ELECTRON BEAM CATHODE RAY TUBE

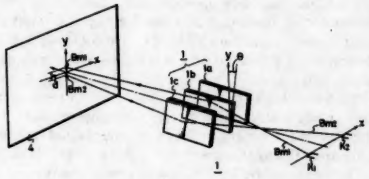
Tsunenari Saito; Akio Murata, and Koichi Sakai, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,173

Claims priority, application Japan, Feb. 14, 1983, 58-22473

Int. Cl.⁴ H01J *29/50, 29/76*

U.S. Cl. 313—413 **8 Claims**



1. A cathode ray tube with a phosphor screen comprising: first and second cathodes mounted on a horizontal line parallel to each other, and deflecting means through which first and second electron beams emitted from said first and second cathodes pass mounted so as to apply to said first and second electron beams a rotational force about the center of the tube axis, whereby said first and second electron beams impinge on said phosphor screen at positions which are vertically spaced apart from each other by a distance of approximately half the distance between adjacent scan lines.

4,604,548

ELECTRON GUN WITH AFTERGLOW ELIMINATOR

Karl G. Hernqvist, Princeton, and Roger C. Alig, Princeton Junction, both of N.J., assignors to RCA Corporation, Princeton, N.J.

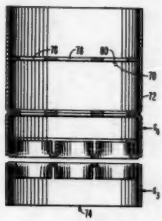
Filed May 29, 1980, Ser. No. 154,237

Int. Cl.⁴ H01J *29/50*

U.S. Cl. 313—414 **2 Claims**

1. In an electron gun for use in a cathode-ray tube, said gun including at least one cathode and a plurality of electrodes, each of said electrodes having a beam aperture aligned along an axis and spaced from the cathode, at least two of said electrodes forming a main focus lens, the electrode nearest said cathode which forms the main focus lens including an extrusion about the beam aperture therein and the other electrode of the main focus lens having a shield cup thereon, the improvement comprising

a plate having a plate aperture aligned with the beam apertures in said electrodes, said plate being located within and spaced from the bottom of said shield cup at the opposite end of said gun from said cathode, for blocking the exit



from said gun of electrons emitted from said extrusion and emerging at an off-axis direction from said beam aperture of the electrode of the main focus lens nearest the cathode to reduce afterglow caused by off-axis electrons.

4,604,549

ORANGE-YELLOW EMITTING PHOSPHOR AND CATHODE-RAY TUBE EMPLOYING THE SAME

Naotoshi Matsuda, Kawasaki, and Masaaki Tamatani, Fujisawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 557,882, Dec. 5, 1983, abandoned. This application Aug. 19, 1985, Ser. No. 767,076

Claims priority, application Japan, Dec. 7, 1982, 57-213308

Int. Cl.⁴ C09K *11/477*

U.S. Cl. 313—468 **11 Claims**

1. An orange to yellow emitting phosphor, consisting essentially of an europium and terbium co-activated indium borate represented by the formula:

$$(In_{1-a-b}Eu_aTb_b)BO_3$$

wherein a and b are such that $0.0001 \leqq a \leqq 0.04$ and $0.0001 \leqq b \leqq 0.04$ and exhibiting a longer 10% afterglow time under electron excitation than a mixture of europium activated indium borate and terbium activated indium borate phosphors having the same quantity of europium and terbium.

4,604,550

DISPLAY TUBE WITH TERBIUM-ACTIVATED BLUE-LUMINESCING PHOSPHOR SCREEN

Jan L. van Koesveld, and Roelof E. Schuil, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1984, Ser. No. 667,043

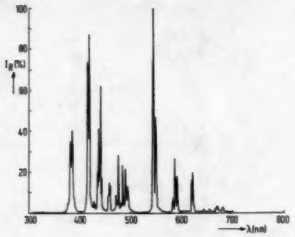
Claims priority, application Netherlands, Nov. 3, 1983, 8303782

Int. Cl.⁴ H01J *31/00, 29/10;* **C09K** *11/08*

U.S. Cl. 313—478 **8 Claims**

1. A display tube comprising in an evacuated envelope means to generate at least one electron beam which is focused on a display screen and describes a field thereon, which display screen comprises a terbium-activated phosphor on a carrier, and in which the light emitted by the phosphor falls through a filter, characterized in that the energy of the emissions of the phosphor which find their origin in the $^5D_3$-level of terbium, is at least 40% of the energy of the emissions of all terbium levels and the filter has a transmission of more than 75% at those wavelengths where the $^5D_3 \rightarrow {}^7F_5$ and the $^5D_3 \rightarrow {}^7F_4$ emissions of terbium are located and the filter has a transmission of less

than 10% at those wavelengths where the $^5D_4 \rightarrow {}^7F_5$ and the $^5D_4 \rightarrow {}^7F_4$ and the $^5D_4 \rightarrow {}^7F_3$ emissions of terbium are located so



that the color point of the filtered light is located in the range $x \leqq 0.200$ and $y \leqq 0.100$ in the CIE color triangle.

4,604,551

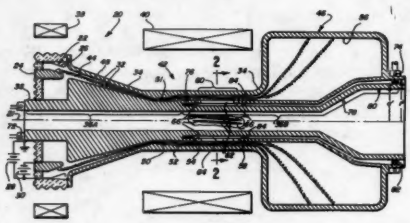
CYCLOTRON RESONANCE MASER SYSTEM WITH MICROWAVE OUTPUT WINDOW AND COUPLING APPARATUS

Charles P. Moeller, Del Mar, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 517,570, Jul. 26, 1983, Pat. No. 4,523,127, which is a continuation-in-part of Ser. No. 463,144, Feb. 2, 1983, abandoned. This application Jun. 20, 1984, Ser. No. 622,672

Int. Cl.[4] H01J *25/00*

U.S. Cl. 315—4 **44 Claims**



1. A cyclotron resonance maser system comprising:

an assembly of components disposed successively along a common axis and including successively and coaxially an annular source of electrons, tunnel means for defining a beam tunnel symmetrically disposed about said axis, interaction means for defining an electron-microwave interaction region symmetrically disposed about said axis, a first coaxial waveguide coupled to said interaction means, and an annular collector of electrons,

means for forming electrons from said source into an annular beam of electrons having substantial energy transverse of said beam and directing said beam of electrons successively through said beam tunnel, said interaction region and said coaxial waveguide to said collector,

a second coaxial waveguide coaxial with and surrounded by said first coaxial waveguide and extending coaxially through said electron collector, and

symmetric coaxial coupling means for coupling microwave energy between said first and second coaxial waveguides.

4,604,552

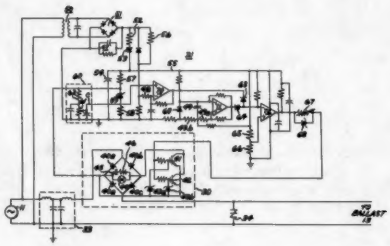
RETROFIT FLUORESCENT LAMP ENERGY MANAGEMENT/DIMMING SYSTEM

Robert P. Alley, Clifton Park, N.Y.; Paul G. Huber, Warwick, and Joseph M. Sullivan, Coventry, both of R.I., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 30, 1984, Ser. No. 645,593

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—176 **23 Claims**



1. A method for maintaining filament heating in a fluorescent lamp dimming system wherein a dimming circuit supplied by an AC line source supplied voltage to a ballast for a fluorescent lamp, the ballast voltage including a low frequency component having a variable duty cycle during each half wave thereof to dim said lamp said low frequency component being passed through said ballast to said lamp and to the filaments of said lamp, said method comprising the steps of:

adding a high frequency component to said ballast voltage, at least during times that said low frequency component is insufficient to maintain filament heating, said high frequency being greater than the resonant frequency of said ballast; and

restricting said high frequency component to cause current flow substantially only in the filaments of said lamp, whereby the filament voltage is maintained while the filament-to-filament current through said lamp is substantially unaffected by said high frequency component.

4,604,553

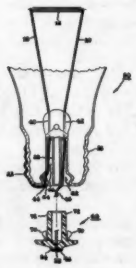
BASELESS INCANDESCENT LAMP

Jerry C. Kosmach, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,995

Int. Cl.[4] H01J *5/48*

U.S. Cl. 313—315 **12 Claims**



1. An incandescent lamp devoid of an electrically conductive base and comprising a single unit which forms; (1) an outer envelope; (2) complementary threads for mating with an electrical socket; and (3) an insulative stem, said lamp further

comprising a filament rigidly disposed within said outer envelope by said insulative stem and connected between a pair of inleads, said inleads being connected to respective outer leads, one of said outer leads being electrically connected to at least a portion of said complementary threads by a layer of sprayed particles of electrically conductive material, wherein said single unit has a central hollow portion and means effective to electrically connect the other outer lead to a center contact comprising:

(a) a cylindrical stem member formed of thermoplastic material and having selected complementary dimensions of said hollow portion effective to be inserted into and rigidly lodged within said hollow portion; and

(b) a layer of said electrically conductive material covering said other outer lead and providing electrical contact of said other outer lead to a complementary portion of an electrical socket when the baseless incandescent lamp is so inserted.

4,604,554

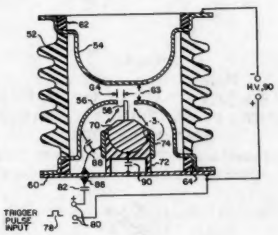
TRIGGERED SPARK GAP DISCHARGER

Roy E. Wootton, Murrysville, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 5, 1984, Ser. No. 617,449

Int. Cl.[4] H01J *17/36;* H01T *2/02*

U.S. Cl. 315—330 **8 Claims**



1. A triggered spark gap discharger comprising:

means forming a chamber;

first and second primary electrodes having opposed electrode surfaces and defining a primary arc gap within said chamber;

an ionizable gaseous medium in said chamber;

a trigger electrode assembly having a trigger probe defining a trigger gap between itself and said first primary electrode, said trigger gap being smaller than said primary gap;

said trigger electrode assembly having a metallic member insulated from said trigger probe defining an auxiliary gap between itself and said trigger probe, said auxiliary gap being shorter than said trigger gap;

means for applying a high voltage between said primary electrodes; and

means for connecting a trigger pulse source between said metallic member and said first primary electrode.

4,604,555

INTENSITY MODULATION CIRCUIT FOR CATHODE-RAY TUBES

Nobuo Karaki, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 13, 1984, Ser. No. 640,480

Claims priority, application Japan, Aug. 12, 1983, 58-147819

Int. Cl.[4] H01J *29/52;* G09G *1/14*

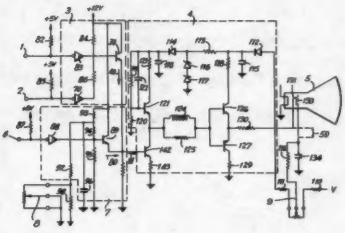
U.S. Cl. 315—383 **19 Claims**

1. An intensity modulation circuit for a cathode-ray display device comprising:

(a) designation means for producing digital signals representative of at least two areas of the display of said cathode-ray tube;

(b) analog signal producing means for producing from said digital signals analog video signals having at least two brightness grades one of said grades being associated with each of said areas of the display;

(c) intensity modulation means coupled to said analog signal producing means for varying the amplification of the



analog video signal in at least one but not all of said grades;

(d) output amplification means for receiving said analog video signals and for driving said cathode-ray tube in response thereto and switching means for switching said display device from an intensity modulation mode to an image superposition mode, said switching means coupled to said designation means.

4,604,556

TELEVISION RECEIVER LOAD COMPENSATION CIRCUIT

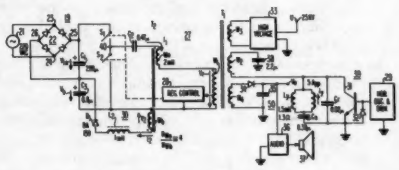
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 23, 1983, Ser. No. 564,912

Claims priority, application United Kingdom, Jul. 1, 1983, 8317970

Int. Cl.[4] H01J *29/70;* H04N *5/63*

U.S. Cl. 315—411 **11 Claims**



1. A regulated power supply and deflection circuit, comprising:

a deflection winding;

a deflection circuit coupled to said deflection winding for generating scanning current therein;

a flyback transformer coupled to said deflection circuit;

a retrace resonant circuit for producing transformer retrace pulse voltages across windings of said flyback transformer during a retrace interval;

a source of supply energy;

a load circuit coupled to a winding of said flyback transformer and energized by the voltage developed across that winding to draw a load current therefrom;

a first inductance coupled to said flyback transformer;

switching means for coupling said source of supply energy to said first inductance, said switching means varying in conduction for controlling the energy stored in said first inductance and transferred to said load circuit;

a second inductance coupled to said flyback transformer; and

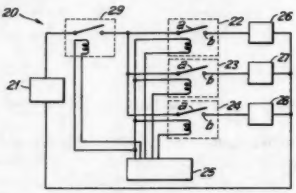
means for producing variation of current in said second inductance that is indicative of variation of the load current drawn by said load circuit, said flyback transformer coupling said second inductance to said retrace resonant circuit for controlling the retrace time in accordance with said variation of current in said second inductance.

4,604,557

VENDING MACHINE POWER SWITCHING APPARATUS

John C. Cowles, Bensalem, Pa., assignor to Mars Incorporated, McLean, Va.

Filed Oct. 10, 1984, Ser. No. 659,385
Int. Cl.[4] H02P 7/74
U.S. Cl. 318—98 **11 Claims**



1. An improved vending machine power switching apparatus comprising:

a plurality of relays for selecting which of a plurality of loads in a vending machine is to be energized, each of said relays having a coil and one set of switching contacts;

a power switching means connected in series with the switching contacts of each of the plurality of relays, said power switching means selectively controlling whether power is connected to the switching contacts of said relays;

each of said relays being associated on a one-to-one basis with a corresponding one of said loads so that when the power switching means connects power to the switching contacts of said relays, power flows through only one set of switching contacts, and the failure of the contacts of any one of said relays only prevents the selection of its associated load; and

an electronic switching control means having an output for producing electrical control signals connected to each of the coils of each of the plurality of relays for controlling the switching of the relays by producing the appropriate electrical control signals so that a relay is switched so as to select its associated load for energization only when the power switching means has disconnected power from the relay's switching contacts and a relay switch is switched to terminate the selection of its associated load only when the power switching means has previously disconnected power from the relay's switching contacts, whereby improved relay switching contact reliability is achieved.

4,604,558

MOTOR DRIVE ASSEMBLY HAVING A FLOATING SWITCH ACTUATOR

George Hirsch, Fort Lee, N.J., assignor to Vernitron Corporation, Lake Success, N.Y.

Filed Jul. 25, 1985, Ser. No. 758,731
Int. Cl.[4] H02P 7/00
U.S. Cl. 318—436 **12 Claims**

1. A motor drive assembly for a load, comprising:

a first support;

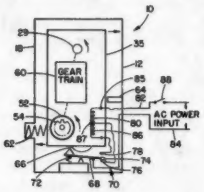
a shaft rotatably carried by said support for driving a load;

a movable second support;

an electric motor carried by said second support and having a rotor operatively coupled to said shaft to drive the same with predetermined torque;

a circuit means; and

a switch means carried by said first support, connected to



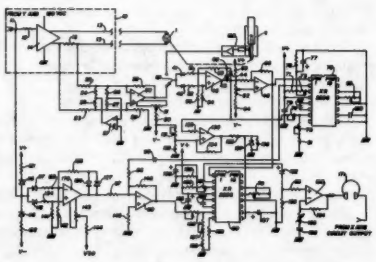
said circuit means, and arranged to actuate said circuit means, said switch means being disposed adjacent to said second support for operation by said second support when said second support moves in response to said rotor's exerting torque greater than said predetermined torque.

4,604,559

APPARATUS AND METHOD FOR PROVIDING USEFUL AUDIO FEEDBACK TO AID IN THE OPERATION OF REMOTELY CONTROLLED POWERED MANIPULATORS

Graham S. Hawkes, and Walter I. Glz, both of Oakland, Calif., assignors to Deep Ocean Engineering Incorporated, Oakland, Calif.

Filed Feb. 15, 1983, Ser. No. 466,433
Int. Cl.[4] G05B 9/02
U.S. Cl. 318—563 **23 Claims**



1. An audio feedback system for monitoring and aiding in user control of a remotely operated, powered manipulator comprising:

means providing an electrical signal proportional to manipulator force;

means providing an electrical signal proportional to manipulator speed;

a signal generator;

frequency modulation means connected to one of said electrical signals for varying the output frequency of said signal generator in proportion to said signal;

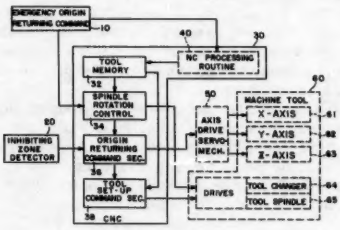
amplitude modulation means connected to the other of said electrical signals for varying the output amplitude of said signal generator in proportion to said other signal; and

means for audibly reproducing the output of said signal generator.

4,604,560
NUMERICAL CONTROL MACHINE TOOL WITH AN EMERGENCY ORIGIN RETURNING FUNCTION

Syoji Inagaki, Kariya; Hideyuki Sanpe, Toyota, and Norimitsu Makihara, Gamagouri, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1983, Ser. No. 537,446
Claims priority, application Japan, Oct. 13, 1982, 57-179218
Int. Cl.[4] G05B *19/10*
U.S. Cl. 318—567 **3 Claims**

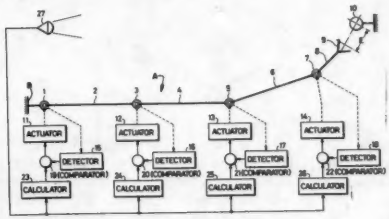


1. A numerical control (NC) machine tool comprising:
a frame;
a spindle head rotatably carrying a tool spindle;
a spindle drive motor drivingly connected to said tool spindle;
a work table for mounting a workpiece thereon;
an NC drive axis for effecting relative movement between said spindle head and said work table in an axial direction of said tool spindle;
a tool magazine for storing a plurality of tools;
a tool changer for selectively attaching said tools to said tool spindle;
command means manually operable for generating a command signal instructing the returning of said NC drive axis to a machine origin;
an origin detector for generating an origin signal when said NC drive axis is returned to said machine origin;
a return inhibiting zone detector operable by the relative movement between said spindle head and said work table in the axial direction of said tool spindle for generating a return inhibiting signal when said NC drive axis is within a return inhibiting zone which is defined in the vicinity of said machine origin; and
a numerical controller connected to said spindle drive motor, said NC drive axis, said tool changer, said command means, said origin detector and said return inhibiting zone detector and operable for controlling said NC drive axis and said tool changer in accordance with a numerical control program so as to perform a series of machinings on said workpiece, said numerical controller including,
memory means for registering a tool being presently used on said tool spindle,
origin returning control means responsive to said command signal from said command means for controlling said NC drive axis to discontinue advance movement and then to effect origin returning movement until said origin signal is output from said origin detector, wherein said origin returning movement is performed in such a manner that when said NC drive axis is within said return inhibiting zone upon the manual operation of said command means, said NC drive axis is moved first out of said return inhibiting zone in an opposite direction away from the machine origin and then is reversed toward said machine origin,
direction decision means for determining the direction in which said tool spindle is to be rotated durig said origin returning movement of said NC drive axis under the control of said origin returning control means, by reference to said tool being registered in said memory means, and
rotation control means for controlling said spindle drive motor to rotate said tool spindle in said direction determined by said direction means during said origin returning movement of said NC drive axis under the control of said origin returning control means.

4,604,561
CONTROL APPARATUS FOR MULTI-JOINTED ARM MECHANISM

Kohji Kamajima, Ibaraki; Yoshiyuki Nakano, Hitachi; Masakatsu Fujie; Yuji Hosoda, both of Ibaraki; Taro Iwamoto, Mito, and Kazuo Honma, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,958
Claims priority, application Japan, Oct. 17, 1983, 58-192352
Int. Cl.[4] G05B *19/10*
U.S. Cl. 318—567 **19 Claims**



1. A control apparatus for a multi-jointed arm mechanism having a plurality of arm elements which are respectively driven by actuator means, the control apparatus comprising input means for detecting information indicative of a displacement of the multi-jointed arm mechanism relative to a target position therefor and for providing a common output indicative of the displacement as a commmon control error signal, arithmetic means coupled to the actuator means of at least one of the arm elements for calculating a target movement magnitude of the arm element in response to the common control error signal from the input means and predictive information of the displacement calculated on the basis of movement information of the arm element and for providing an output target movement magnitude signal, means for detecting an actual movement magnitude of the arm element and providing an output signal indicative thereof, and comparison means for comparing the actual movement magnitude signal from the detecting means and the target movement magnitude signal from the arithmetic means and for providing an output signal indicative of the deviation therebetween to the associated actuator means for the arm element.

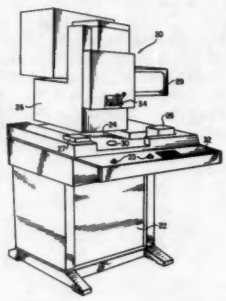
4,604,562
FEEDBACK-CONTROLLED WORKPIECE POSITIONING SYSTEM

Edward H. Phillips, Middletown, and Lawrence A. Wise, Sunnyvale, both of Calif., assignors to Eaton-Optimetrix Inc., San Jose, Calif.

Filed Sep. 29, 1982, Ser. No. 427,716
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—640 **30 Claims**

1. Apparatus for positioning a workpiece at a predetermined coodinate location relative to a datum, said apparatus comprising:
a stage, movable along coordinate axes, for holding the workpiece, said stage being positioned at a desired coodinate stage position when the workpiece is positioned at a predetermined location;
measurment means for determining the coordinate position

of the stage relative to the datum, said measurement means including an array of uniformly spaced coordinate indicia affixed to the stage for movement therewith, a sensor means for generating at least three spatially periodic sensor signals for each axis of movement of the state with the signals generated for each axis of movement having periods corresponding to the spacing of the coordinate indicia and being spatially out of phase by a uniform offset, and signal processing means for processing the sensor signals



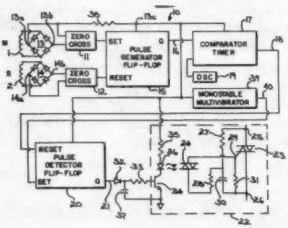
to produce a stage position signal determinative of the coordinate position of the stage relative to the datum; and positioning means for moving the stage to position the workpiece at the predetermined location, said positioning means including comparison means for comparing the stage position signal with input address information specifying the desired coordinate stage position to provide a positional error, and servo drive means for moving the stage in response to the positional error so as to minimize the positional error.

4,604,563

ELECTRONIC SWITCH FOR STARTING AC MOTOR

Young-Kee Min, Milwaukee, Wis., assignor to PT Components, Inc., Milwaukee, Wis.

Filed Dec. 11, 1984, Ser. No. 680,488
Int. Cl.[4] H02P *1/04*
U.S. Cl. 318—786 **12 Claims**



1. In an AC motor having a main winding and a start winding both connectable to an AC power source, and having a switch for disconnecting said start winding from said AC source, an improved control circuit for said switch comprising:

means for sensing main winding voltage;

means for sensing start winding voltage;

pulse generator means responsive to each of said voltage sensing means for generating a first set of variable width pulses having a width determined by the phase differential between said voltages;

comparator timer means responsive to said pulse generator means for outputting a second set of pulses for turning off said switch to disconnect said start winding from said AC source responsive to a given condition of said first set of pulses;

output pulse detector means responsive to said comparator timer means for detecting said second set of pulses and outputting a turn-off signal to said switch,

the pulse width of pulses in said first set of pulses increasing with increasing motor speed to a maximum value, and then decreasing while motor speed continues to increase, said decreasing pulse width passing through a given value corresponding to a threshold motor speed at which said start winding should be disconnected from said AC source,

said given condition of said first set of pulses to which said comparator timer means responds is said increasing pulse width passing through said given value prior to said maximum value,

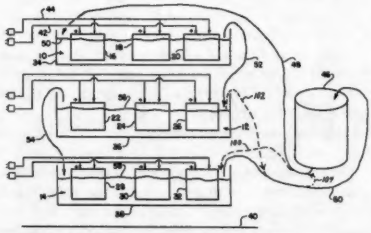
and comprising delay means for delaying one of said first set of pulses, said second set of pulses and said turn-off signal such that said switch is turned off after said pulse width increasingly passes through said given value and before said pulse width decreasingly passes back through said given value subsequent to said maximum value.

4,604,564

TEMPERATURE CONTROLLED, AUTO TIMED, VARIABLE AMPERAGE CASCADING-WATER FORMATION METHOD FOR USE WITH HIGH ANTIMONY AND MAINTENANCE FREE LEAD-ACID BATTERIES

Lawrence Windisch, Selma, Ala.; John Nees, and Harry Channing, both of Wyomissing, Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 910,942, May 30, 1978, Pat. No. 4,215,307, which is a continuation-in-part of Ser. No. 821,527, Aug. 3, 1977, Pat. No. 4,117,387. This application Dec. 10, 1979, Ser. No. 101,897
The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.
Int. Cl.[4] H02J *7/00*; H01M *10/50*
U.S. Cl. 320—2 **9 Claims**



1. A method for producing batteries having plastic cases comprising the steps of:

(a) separating a plurality of batteries into a plurality of sets;

(b) providing a plurality of container means for holding a plurality of battery sets;

(c) placing said sets of batteries into said container means, one set for each container means and electrically interconnecting said batteries in each set for connection to a separate rectifying means for each set;

(d) stacking said plurality of container means at a plurality of positions at different heights above a forming room floor;

(e) connecting each set of said batteries to said separate rectifying means for charging said plurality of batteries in each set;

(f) continuously providing cooling fluid to maintain each of said plurality of container means at a predetermined level, and to circulate said cooling fluid therethrough by causing

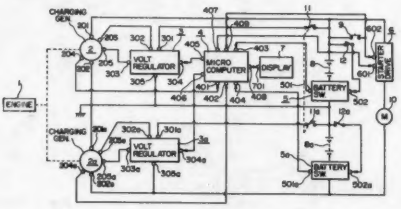
said cooling fluid to overflow from said container means; and

(g) forming said sets with said rectifying means while maintaining said cooling fluid within each of said container means at a temperature of between 100° to 125° F.

4,604,565
MICROCOMPUTER-CONTROLLED DC THREE-WIRE CIRCUIT FOR VEHICLE

Mitsuyoshi Yokota; Akio Matsumoto, and Mitsuharu Morishita, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Hyogo, Japan

Filed May 20, 1983, Ser. No. 496,711
Claims priority, application Japan, May 20, 1982, 57-87092
Int. Cl.⁴ H02J 7/14
U.S. Cl. 320—15 **7 Claims**



1. A microcomputer-controlled DC three-wire circuit for a vehicle, comprising; first and second charging generators driven by an engine of said vehicle and magnetically separated from one another, and each having a rectifier; a first voltage regulator for detecting an output voltage of said first charging generator, and for controlling said output voltage to a first predetermined value; a second voltage regulator for detecting an output voltage of said second charging generator, and for controlling said output voltage to a second predetermined value; a first battery switch unit, a first battery connected through said first battery switch unit between a pair of terminals of said first charging generator; a starter switch electrically connected to at least said first battery; a second battery switch unit, a second battery connected through said second battery switch unit between a pair of terminals of said second charging generator; and an electric load connected between a positive terminal of one of said charging generators and a negative terminal of the other of said charging generators, and

means including a microcomputer which receives data on the on-off states of said first and second battery switch units, one of (a) first and second engine-speed related output signals of said first and second charging generators, respectively, or, (b) rotation signal data from said engine, and an output signal of said starter switch, for protecting said rectifiers in said first and second charging generators and said load and for preventing undue discharging of said first and second batteries.

4,604,566
VOLTAGE PULSE TO CURRENT REGULATING CONVERTOR

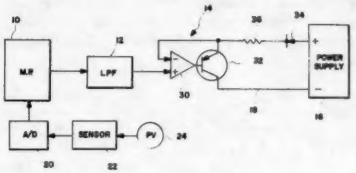
Edward L. Sterling, Jr., Cleveland, and Edward Bastijanic, Concord, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 7, 1985, Ser. No. 763,486
Int. Cl.⁴ G05F 1/58; G08C 19/02
U.S. Cl. 323—275 **14 Claims**

1. A voltage pulse to current regulating convertor comprising:

pulse generator means for generating a voltage pulse train having a selected frequency and a variable duty cycle;

a low pass filter connected to said pulse generator means for receiving said voltage pulse train and for generating a D/C voltage level which corresponds to the duty cycle of said voltage pulse train, said low pass filter having a cutoff frequency which is less than said selected frequency; and

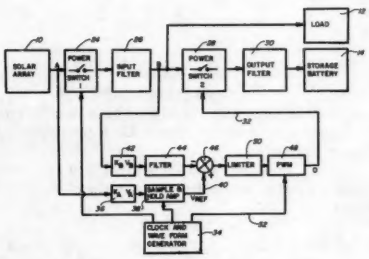


current drawing means connected to said low pass filter for drawing a current which is proportional to the D/C voltage level.

4,604,567
MAXIMUM POWER TRANSFER SYSTEM FOR A SOLAR CELL ARRAY

P. R. K. Chetty, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 11, 1983, Ser. No. 540,418
Int. Cl.⁴ G05F 5/00
U.S. Cl. 323—299 **12 Claims**



1. In a system for transferring power from a solar array to a load, an improved means for operating said solar array at its maximum power point comprising:

means for sampling the open circuit voltage of the solar array;

means for sensing the operating voltage of said solar array;

means responsive to the open circuit voltage and the operating voltage of said solar array for providing an error signal;

means responsive to said error signal for altering a condition of said load to operate the solar array at its maximum power point.

4,604,568
CURRENT SOURCE WITH ADJUSTABLE TEMPERATURE COEFFICIENT

Yolanda Prieto, Miami, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1984, Ser. No. 655,837
Int. Cl.⁴ G05F 3/26
U.S. Cl. 323—315 **19 Claims**

1. In a monolithic integrated circuit, a circuit arrangement for providing a current having a controlled variation with temperature comprising:

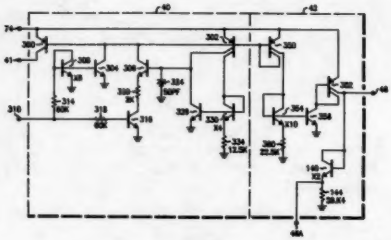
a first resistive pattern area having a first predetermined temperature coefficient of resistivity;

a current source coupled to said first resistive pattern area

for supplying a first current having a first temperature coefficient of current which is a function of said first predetermined temperature coefficient of resistivity;

a current mirror receiving said first current as its reference current and producing a mirror current; and

a second resistive pattern area having a second predetermined temperature coefficient of resistivity, which is



different from said first temperature coefficient of resistivity, said second resistive pattern area being coupled to said current mirror,

whereby said mirror current has a controlled variation with temperature characterized by a temperature coefficient which is a function of said first and second predetermined temperature coefficients of resistivity.

4,604,569

MULTIMETERS

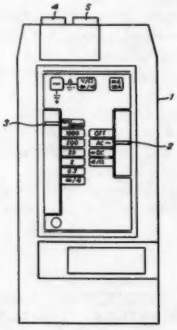
David C. Tedd, Folkestone, and David M. Kennedy, Hythe, both of England, assignors to Thorn EMI Instruments Limited, Dover, England

Filed Jul. 1, 1983, Ser. No. 510,353

Claims priority, application United Kingdom, Jul. 2, 1982, 8219252

Int. Cl.[4] G01R *15/12*

U.S. Cl. 324—73 R **12 Claims**



1. A multimeter comprising a first user-operable switching means for selecting one of a first group of different measurement functions, a second user-operable switching means for selecting one of a second group of different measurement functions and further means, responsive to said first and second switching means to initiate an indication, perceptible by a user, whenever said respective measurement functions, selected from said first and second groups, are incompatible with one another.

4,604,570

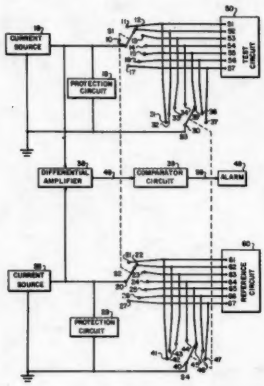
SYSTEM FOR COMPARING CONDITIONS BETWEEN SELECTED PAIRS OF TERMINALS IN TEST CIRCUIT WITH CONDITIONS BETWEEN LIKE TERMINAL PAIRS IN REFERENCE CIRCUIT

Richard W. Thorpe, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Continuation of Ser. No. 344,665, Feb. 1, 1982, abandoned. This application May 29, 1985, Ser. No. 738,824

Int. Cl.[4] G01R *15/12*

U.S. Cl. 324—73 R **8 Claims**



1. A system for testing the impedance between different selected pairs of test terminals in a plurality of test terminals of linear and nonlinear test circuits in comparison to the impedance between corresponding pairs of reference terminals in a plurality of reference terminals of corresponding linear and non linear reference circuits during a transient response period, comprising:

first stepping switch means having a first output terminal and a first plurality of input terminals, each input terminal in said first plurality of input terminals adapted for connection to a respective one in a plurality of test terminals, for connecting said first output terminal to any selected input terminal in said first plurality of input terminals;

second stepping switch means having a second output terminal and a second plurality of input terminals, each input terminal in said second plurality of input terminals corresponding to an input terminal in said first plurality of input terminals and adapted for connection to a respective one in a plurality of reference terminals which corresponds to a respective one in a plurality of test terminals, for simultaneously connecting said second output terminal to an input terminal of said second plurality of input terminals that corresponds to the input terminal of said first plurality of the input terminals then selectively connected to said first output terminal by said first stepping switch means;

third stepping switch means having a third output terminal and a third plurality of input terminals, each input terminal in said third plurality of input terminals adapted for connection to a respective one in a plurality of test terminals, for connecting said third output terminal to any selected input terminal in said third plurality of input terminals notwithstanding the connection effected by said first stepping switch means;

fourth stepping switch means having a fourth output terminal and a fourth plurality of input terminals, each input terminal in said fourth plurality of input terminals corresponding to an input terminal in said third plurality of input terminals and adapted for connection to a respective one in a plurality of reference terminals which corresponds to a respective one in a plurality of test terminals,

for simultaneously connecting said fourth output terminal to an input terminal of said fourth plurality of input terminals that corresponds to the input terminal of said third plurality of input terminals then selectively connected to said third output terminal by said third stepping switch means;

first constant current source means connected across said first and third output terminals for providing a first predetermined current so as to flow through a test circuit connected between an input terminal of said first plurality of input terminals and an input terminal of said third plurality of input terminals respectively connected to said first and third output terminals by said first and third stepping switch means;

second constant current source means connected across said second and fourth output terminals for providing a second predetermined current so as to flow through a reference circuit connected between an input terminal of said second plurality of input terminals and an input terminal of said fourth plurality of input terminals respectively connected to said second and fourth output terminals by said second and fourth stepping switch means;

differential amplifier means connected to said first and second output terminals for comparing, in response to the application of said first and second predetermined currents, a first transient response voltage appearing at said first output terminal with respect to said third output terminal during a transient response period with, a second transient response voltage appearing at said second output terminal with respect to said fourth output terminal during said transient response period, and for providing a difference signal corresponding to the difference in amplitude between the compared first and second transient response voltages during said transient response period; and

comparator means connected to said differential amplifier means for comparing the amplitude of said difference signal to a predetermined voltage threshold signal and for providing an alarm signal in response to the comparison of said difference signal and said predetermined voltage threshold signal when the amplitude of said difference signal exceeds said predetermined voltage threshold signal.

4,604,571

CIRCUIT FOR THE DETERMINATION OF VOLTAGE EXTREMA

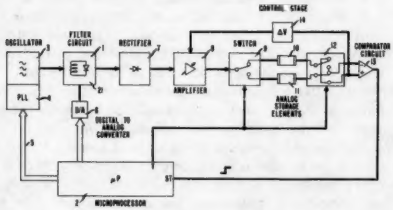
Gerhard Maier, Dauchingen, and Joachim Lange, Villingen-Schwenningen, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,173

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306401

Int. Cl.[4] G01R *23/16*

U.S. Cl. 324—77 A **15 Claims**



1. A circuit for measuring and recognizing of a maximum output voltage at an electronic filter comprising

a generator for providing a fixed measurement frequency,

a control unit providing a stepwise adjustable control voltage;

an electronic filter circuit fed with the fixed measurement frequency from the generator where the electronic filter comprises a tuning diode, and receiving the stepwise adjustable control voltage; a direct current rectifier-amplifier connected to the output of the electronic filter circuit for rectifying and amplifying the output measurement voltage of the electronic filter circuit;

a clocked switch having its input connected to the output of the rectifier-amplifier and said clocked switch having two outputs;

an analog intermediate storage connected to one output of the clocked switch for storing the voltage value at the respective output of the clocked switch;

an intermediate switch clocked by the control unit and connected to the output of the analog intermediate storage; and

a stop pulse generator stage connected to the output of the intermediate switch for providing a pulse upon the reaching of a maximum value of the measurement voltage and connected to the control unit for transmitting the pulse to the control unit such that the control unit interrupts a further change of the tuning voltage for the electronic filter.

4,604,572

DEVICE FOR TESTING SEMICONDUCTOR DEVICES AT A HIGH TEMPERATURE

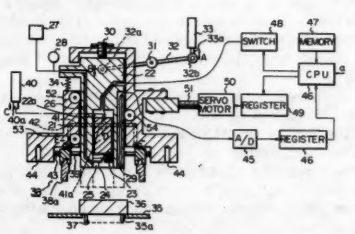
Akinori Horiuchi, Tokyo; Toshio Binnaka, Kawasaki, and Shigeyuki Maruyama, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 395,906, Jul. 7, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 673,203

Claims priority, application Japan, Jul. 8, 1981, 56-102058[U]; Jul. 31, 1981, 56-113863[U]

Int. Cl.[4] G01R *31/26, 31/28*

U.S. Cl. 324—158 F **10 Claims**



1. A system for testing semiconductor devices at a high temperature comprising: a heating portion where the semiconductor device to be tested is heated to a predetermined temperature; a testing portion where the semiconductor device is tested; means for chucking said semiconductor device, the chucking means having means for heating the semiconductor device and a thermosensor for the semiconductor device; means for conveying said semiconductor device chucked by the chucking means from the heating portion to the testing portion; and means for controlling the temperature of the heating means installed within said chucking means in response to the output of said thermosensor.

4,604,573
DRIFT RESISTANT MAGNET STRENGTH SIGNAL EVALUATION CIRCUIT

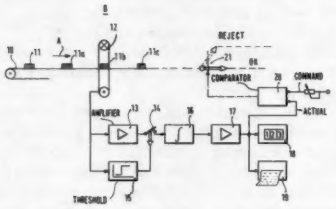
Manfred Eyermann, Vaihingerstrasse 109, D-7132 Illingen; Günter Kettenacker, Wolfsgasse 34, D-7141 Höpfigheim, and Kurt Zimmermann, Berliner Strasse 8, D-7120 Bietigheim, all of Fed. Rep. of Germany

Filed Oct. 20, 1982, Ser. No. 435,405

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207370

Int. Cl.[4] G01N *27/74*; G01R *33/12*

U.S. Cl. 324—205 **3 Claims**



1. Apparatus, including a drift-resistant evaluation circuit, for testing the strength of each of a sequence of magnetic components (**11**, **11*a***, **11*b***, **11*c***) of substantially identical physical orientation, having

an electromagnetic sensing means (**12**) providing an output signal representative of the magnetic strength of the component being tested,

an amplifier (**13**) for receiving and amplifying said output signal, and

an integrator (**16**) connected to receive the output signal, integrating the output signal over time, and providing an output control signal,

wherein, in order to prevent noise signals and signals of undesired polarity from reaching said integrator (**16**) and resulting in drift of said output control signal away from values representative solely of said magnetic strength,

there are provided:

a polarity-sensitive threshold circuit (**15**) connected in parallel with said amplifier, for receiving the output signal and testing said output signal to see if it exceeds a predetermined threshold with a given polarity and

controlled switching means (**14**), connected in said evaluation circuit in advance of the integrator (**16**), connected to and controlled by said threshold circuit (**15**), and applying the output signal from said sensing means to the integrator only if

(a) the polarity of the output signal is in accordance with predetermined polarity; and

(b) the level of the output signal is above a predetermined threshold level,

thereby preventing noise signals below said threshold level and output signals of polarity opposite to said predetermined polarity from reaching and being integrated by said integrator.

4,604,574
ROTATING PROBE INDICATING THE ANGLE OF INTERSECTION WITH A SURFACE

Thomas Posluszny, Juno Isles; Kevin D. Smith, Palm Beach Gardens, and Paul W. Schlie, Lake Worth, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 15, 1984, Ser. No. 580,505

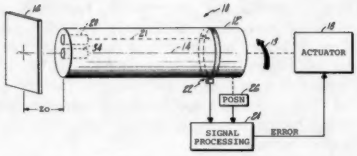
Int. Cl.[4] G01B *7/30*, *7/14*

U.S. Cl. 324—207 **4 Claims**

1. Apparatus indicating the angle of intersection between the axis (**14**) of a rotating member (**12**) and a surface (**16**), comprising:

a rotating member (**12**) having an axis (**14**) of rotation;

a sensor (**20**), disposed off-axis on the rotating member, for providing a lift-off signal indicative of the instantaneous lift-off of the sensor from the surface;



means (**26**) for providing a theta signal indicative of the instantaneous rotational position of the sensor with respect to the axis;

means (**24**) for providing an orientation signal indicative of the intersection angle between the axis and the surface in response to the lift-off signal and the theta signal.

4,604,575
MULTIPLE OUTPUT ROTATIONAL POSITION DETECTION DEVICE

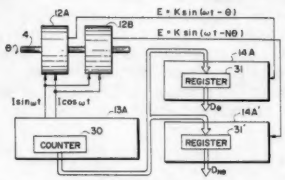
Wataru Shimizu, and Akira Yamashita, both of Tokyo, Japan, assignors to Kabushiki Kaisha SG, Tokyo, Japan

Division of Ser. No. 311,277, Oct. 14, 1981. This application Oct. 15, 1984, Ser. No. 661,199

Claims priority, application Japan, Oct. 21, 1980, 55-147425; Nov. 25, 1980, 55-164665

Int. Cl.[4] G01B *7/14*; G01P *3/56*; H01F *21/06*; G05B *1/06*

U.S. Cl. 324—208 **10 Claims**



1. A rotational position detection device comprising:

(a) a first detector, having a cyclic output signal, for detecting an absolute rotational position within one cycle, which cycle corresponds to 1/N circumference (N being a predetermined integer), and comprising a first rotor and a first stator,

said first rotor having teeth of N per one circumference,

said first stator having a plurality of poles arranged in a predetermined arrangement, a first primary winding means separately wound on said respective poles, and a first secondary winding means coupled magnetically to said first primary winding means, said poles having end portions opposing the teeth of said first rotor with gaps therebetween, and said end portions being provided with teeth corresponding to the teeth of said first rotor,

the teeth of said first rotor and the teeth of said first stator being so formed that correspondence between the rotor teeth and the stator teeth is different in pitch by 1/n pitch (n being a predetermind integer) with respect to the adjacent poles so that reluctance change, one cycle of which corresponds to one pitch of the rotor teeth, is produced in said respective poles and the cycle of said reluctance change is different by 1/n pitch with respect to the adjacent poles;

(b) a second detector for detecting an absolute rotational position within one circumference, and comprising a second stator and a second rotor,

said second stator having a plurality of poles arranged in a predetermined arrangement, second primary winding means separately wound on said respective poles, and second secondary winding means coupled magnetically to said second primary winding means, said poles having end portions,

said second rotor being coupled with said first rotor and being of such configuration as to oppose the end portions of the respective poles of the second stator with gaps therebetween, change reluctance of magnetic paths passing the respective poles in accordance with a rotational position at a rate of one cycle per one circumference, and the cycle of said reluctance change being different by 1/k (k being a predetermined integer);

(c) a clock pulse generator;

(d) reference AC signal generation means for generating a plurality of reference AC signals having a predetermined frequency and phases which are different from one another in response to a clock pulse signal generated by said generator;

(e) means for applying said reference AC signals to said first detector and exciting each of said first primary winding means on said poles with any one of said reference AC signals, each pole excitation signal being out of phase with the excitation signals of adjacent poles by a predetermined electrical angle and thereby producing in said first secondary winding means a first output signal resulting by phase shifting the reference AC signals in accordance with the rotational position of said first rotor;

(f) means for applying said reference AC signals to said second detector and exciting each of said second primary winding means on said poles with any one of said reference AC signals, each pole excitation signal being out of phase with the excitation signals of adjacent poles by a predetermined electrical angle and thereby producing in said second secondary winding means a second output signal resulting by phase shifting the reference AC signals in accordance with the rotational position of said second rotor;

(g) first phase difference detection means operatively connected to the clock pulse generator reference AC signal generation means, and means for applying said reference AC signals to said first detector for detecting, by digitally counting said clock pulse signal, the phase difference between a predetermined one of said reference AC signals and said first output signal to obtain detected digital phase difference data as a first absolute rotational position data within 1/N circumference of the first rotor and with an accuracy of rotational position 1/N as small as that obtained by the second detector;

(h) second phase difference detection means operatively connected to the clock pulse generator, reference AC signal generation means, and means for applying said reference AC signals to said second detector for detecting, by digitally counting said clock pulse signal, the phase difference between a predetermined one of said reference AC signals and said second output signal to obtain detected digital phase difference data as a second absolute rotational position data within one circumference of the second rotor; and

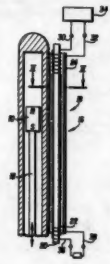
(i) means for obtaining an absolute rotational position by the combination of said first absolute rotational position data and said second absolute rotational position data.

4,604,576

ELECTROMAGNETIC DELAY LINE INCORPORATED IN A POSITION DETECTOR FOR A MOVABLE NUCLEAR REACTOR CONTROL ROD

Michel R. Barrault, Fontaine, France, assignor to Merlin Gerin, Grenoble, France

Filed Mar. 10, 1983, Ser. No. 474,193
Claims priority, application France, Mar. 17, 1982, 82 04665
Int. Cl.[4] G01B *7/14*; G21C *7/00*
U.S. Cl. 324—208 **14 Claims**



1. A detection device for detecting the position of a movable nuclear reactor control rod, comprising:

a permanent magnet attached to the movable control rod and slidable axially inside a non magnetic tube,

a sensor governed by the local action of the permanent magnet for delivering a signal indicative of the position of the movable control rod, the sensor comprising an electromagnetic delay line located adjacent to and along the path of the magnet and including

a rectilinear core of saturable magnetic material cooperating with a winding propagating high frequency pulses,

a generator connected to the input of the delay line to emit high frequency pulses,

measuring means for detecting local saturation of the core facing the permanent magnet, said saturation entailing a variation in the magnetic permeability of the core and a change in pulse propagation conditions in the winding, and

processing means co-operating with the measuring means for generating a signal representative of the position of the control rod.

4,604,577

TEMPERATURE-COMPENSATED MAGNETIC FIELD MEASURING INSTRUMENT

Hiroyoshi Matsumura, Saitama; Toshio Katsuyama, Hachioji; Norio Ohta, Sayama; Tsuneo Suganuma, Tokorozawa; Kazuyuki Nagatsuma, Hachioji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

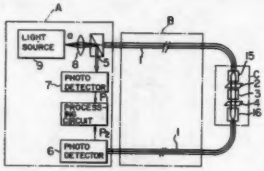
Filed Feb. 1, 1983, Ser. No. 462,765
Claims priority, application Japan, Feb. 15, 1982, 57-21121
Int. Cl.[4] G01R *33/02*; G02B *5/30*; G02F *1/09*
U.S. Cl. 324—244 **23 Claims**

1. A measuring instrument of magnetic field comprising:

a light source part;

a magnetic filed sensing part including a magnetic material, said magnetic material being provided with a medium capable of exhibiting Faraday rotation, said medium having at least one thin magnetic garnet film, means for providing linearly-polarized light from said light source to be vertically indicent upon said at least one thin magnetic garnet film, said thin magnetic garnet film having a composition expressed by a general formula $R_{3-x}Q_x(Fe_{5-y}M_y)O_{12}$ (where R is at least one element selected from a group consisting of Y, La, Lu, Ca, Sm and Bi, Q is at least one element selected from a group consisting of Gd, Eu,

Er, Tb, Yb, Ho and Dy, M is at least one element selected from a group consisting of Ga, Al, Ge, Si, Sc, Mn, In, V and Cr, the value of x lies in a range expressed by a formula $0.1 \leqq x \leqq 3.0$, and the value of y lies in range expressed by a formula $0 \leqq y \leqq 5.0$) so as to provide temperature-compensation for said magnetic field measuring instrument, said thin magnetic garnet film being magnetized in a propagation direction of the linearly-polarized light;



a measuring part for receiving and processing light from said magnetic field sensing part; and

an optical transmission line for optically connecting said light source part, said magnetic field sensing part and said measuring part;

whereby said temperature-compensated measuring instrument enables stable measurement of a magnetic field substantially independent of temperature variation.

4,604,578

NUCLEAR MAGNETIC RESONANCE METHODS AND APPARATUS

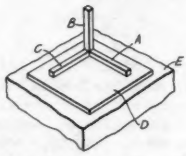
Ian R. Young, Sunbury-on-Thames, England, assignor to Picker International Limited, Wembley, England

Filed Jun. 2, 1983, Ser. No. 500,329

Claims priority, application United Kingdom, Jun. 9, 1982, 8216714

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—307 **14 Claims**



8. A method for investigating the spatial distribution of a quantity of substance in a chose region of a body by NMR techniques, wherein an indication of movement of the body during investigation is obtained by monitoring signals produced by probe means attached to the body and responsive to a magnetic field applied to the body during investigation, said investigation comprising causing nuclear magnetic excitation of nuclei in a selected region of the body, applying a gradient magnetic field in a chosen direction in the selected region to disperse the resonance frequency of excited nuflei in the direction of the gradieat, and causing the resonance signals during the application of said gradient field, wherein the signals produced by said probe means are monitored after excitation of the nuclei in said region, before application of said gradient field, and said signals are subsequently monitored during the application of said gradient field.

4,604,579

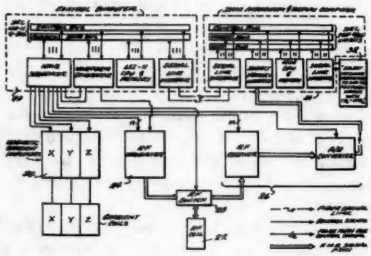
METHOD AND APPARATUS FOR ENHANCED T1 NMR MEASUREMENTS USING REPETITION INTERVALS TR RELATED TO ONE ANOTHER BY INTEGER MULTIPLES

Clifford R. Cannon, Pacifica, and Douglas A. Ortendahl, Berkeley, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jul. 21, 1983, Ser. No. 515,857

Int. Cl.[4] G01N *24/08*; G01R *33/20*

U.S. Cl. 324—309 **23 Claims**



15. Apparatus for generating a spin-lattice relaxation time value T1 for NMR-excited nuclei, said apparatus comprising:

means for measuring an NMR signal intensity value I_1 for said nuclei using a first TR NMR time;

means for measuring an NMR signal intensity value I_2 for said nuclei using a second TR NMR time where said first and second TR times are related to one another by an integer multiplier greater than one; and

means for directly generating a spin-lattice relaxation time T1 for said nuclei from said measured I_1 and I_2 signal intensity values and said TR time.

4,604,580

NUCLEAR MAGNETIC RESONANCE DIAGNOSTIC APPARATUS

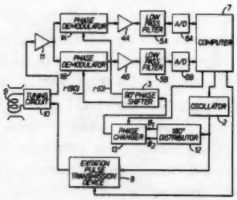
Satoshi Sugiura, Nishi-Nasuno; Mitchio Mitomi, Otawara, and Hirokazu Suzuki, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 9, 1984, Ser. No. 587,974

Claims priority, application Japan, Mar. 11, 1983, 58-40377

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—311 **6 Claims**



1. In nuclear magnetic resonance diagnostic apparatus for image formation, which receives signals induced by nuclear magnetic resonance phenomena, the apparatus comprising:

means for generating high frequency pulses to be applied to the object for excitation of nuclear magnetic resonance synchronized with a cyclic noise component in the signal receiving system;

means for applying said high frequency pulses to the object

and detecting the nuclear magnetic resonance signals evoked from the object;

means for phase demodulating the nuclear magnetic resonance signals received by said transmission and reception means;

means for generating reference signals having the same frequency as said excitation signals and synchronized therewith to supply reference signals for phase demodulation to said phase demodulation means;

means for changing the phase of a first output reference signal from said reference signal generating means to a second signal 180° different in phase;

means for performing phase change control of said first and second output reference signals applied to said phase demodulation means;

means for phase inverting selectively the demodulated outputs obtained by said phase demodulation means by selectively applying to said phase modulating means said two reference signals which differ 180° in phase from each other; and

means for adding corresponding pairs of inverted and noninverted signals of the demodulated outputs for eliminating the cyclic noise component.

4,604,581

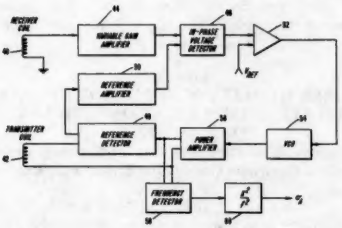
METHOD AND APPARATUS FOR DECONVOLVING APPARENT CONDUCTIVITY MEASUREMENTS IN INDUCTION WELL LOGGING

Suresh G. Thadani, and Gulamabbas A. Merchant, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 11, 1983, Ser. No. 457,150

Int. Cl.⁴ G01V *3/28, 3/18*

U.S. Cl. 324—339 **11 Claims**



1. An induction well logging apparatus for measuring the true conductivity of earth formations in the vicinity of a well borehole comprising:

(a) transmitter and receiver coil system for movement through a well borehole and operated so that variation of propagation effects in the formation are negligible, said coil system providing an output signal related in value to the apparent conductivity of the formation; and

means for operating on said output signal with an inverse vertical response function of said coil system to obtain a signal related in value to an approximation of the true conductivity of an incremental portion of the formation adjacent the well bore at the depth of investigation; and

means for recording said signal related to an approximation of the true conductivity as a function of borehole depth of said coil system.

4,604,582

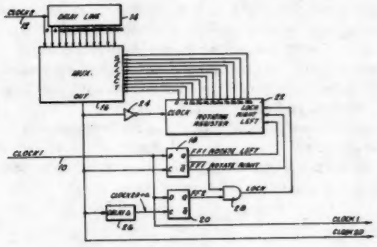
DIGITAL PHASE CORRELATOR

John G. Strenkowski, Whippany, and John P. Yang, BelleMead, both of N.J., assignors to Lockheed Electronics Company, Inc., Plainfield, N.J.

Filed Jan. 4, 1985, Ser. No. 689,072

Int. Cl.⁴ H04J *3/06*; G01R *25/04*; H03L *7/00*

U.S. Cl. 328—55 **6 Claims**



1. A phase correlator for detecting and correcting for phase differences between at least a first and a second signal, said phase correlator comprising a multistep delay line receiving one of said signals and effective to impart a series of different incremental delays to said one of said signals at a plurality of outputs, controllable switching means connected to said outputs of said delay line and effective in response to a first control signal applied thereto at a control input to output selectively one of said incrementally delayed signals, means for detecting the phase difference between said selected output signal of said switching means and the other of said signals and for producing a second control signal as a function of said detection, a multistage rotating register operatively connected to said phase detecting means and having a control input receiving said second control signal and a plurality of output lines operatively connected to said control input of said switching means, said rotating register being effective in response to said second control signal to provide said first control signal to said control input of said switching means, thereby to cause said switching means to output a corresponding one of said incrementally delayed signals to said phase detecting means.

4,604,583

FREQUENCY OFFSET CORRECTING CIRCUIT

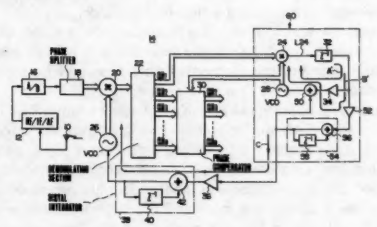
Hidehito Aoyagi, and Botaro Hirosaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 24, 1984, Ser. No. 643,792

Claims priority, application Japan, Aug. 26, 1983, 58-156100

Int. Cl.⁴ H03D *3/00*

U.S. Cl. 329—122 **3 Claims**



1. A frequency offset correction circuit for use in a demodulator, said demodulator including a demodulating section which receives incoming parallel channel signals to recover

each baseband signal of the parallel channels, said frequency offset correction circuit comprising:

a second-order phase-locked loop which includes a first and second control loop and which is coupled to the output of said demodulating section, said second-order phase-locked loop being supplied with a baseband signal of a pilot channel of said parallel channels to compensate for a static phase shift and an abrupt frequency offset using said first and second control loops respectively;

a phase compensator which is coupled to said demodulating section so as to receive the baseband signals of data channels of said parallel channels, said phase compensator being controlled by said second-order phase-locked loop in order to correct the phase shifts and the frequency offsets of said data channels; and

a third control loop which is coupled between said second-order phase-locked loop and the input of said demodulating section, said third control loop being arranged to correct a static or slow-changing frequency offset.

4,604,584

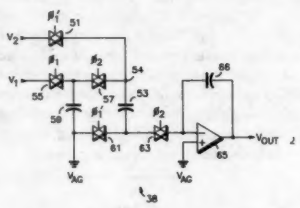
SWITCHED CAPACITOR PRECISION DIFFERENCE AMPLIFIER

Stephen H. Kelley, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 10, 1985, Ser. No. 743,228

Int. Cl.⁴ H03F *3/45*

U.S. Cl. 330—9 **10 Claims**



1. A precision difference amplifier comprising:

first and second charge storage means, for selectively storing first and second input voltages, respectively, said first charge storage means being connected to a reference voltage terminal;

first switching means for coupling the to the first charge storage means during a first time period;

second switching means for coupling the second charge storage means between the second input voltage and the reference voltage terminal during a second time period successive to the first time period;

integrating operational amplifier means having a first input connected to the reference voltage terminal, a second input, an output for providing a difference signal proportional to a differential voltage between the first and second inputs, and feedback charge storage means coupled between the second input and the output thereof; and

third switching means for connecting the first and second charge storage means in series between the reference voltage terminal and the second input of the operational amplifier means during a third time period successive to the second time period.

4,604,585

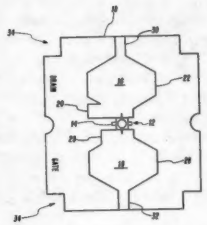
MICROWAVE PLUG-IN SIGNAL AMPLIFYING MODULE

Ben R. Hallford, Wylie, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 7, 1985, Ser. No. 784,961

Int. Cl.⁴ H03F *3/60, 3/14*

U.S. Cl. 330—286 **4 Claims**



1. A low noise, high frequency amplifier module assembly comprising, in combination:

substrate means, including ground plane means on one side of said substrate means and source lead openings in said substrate means from said one side to the opposite side;

gate and drain transmission line means attached to said substrate means on a second side opposite said one side;

FET amplifying means mounted on said second side of said substrate means with drain and gate leads connected to said drain and gate transmission line means respectively and said source leads connected through said source lead openings in said substrate means to the ground plane means on said one side;

first transformer tuning means including first and second tuning screws mounted on said one side and juxtaposed said drain transmission line means for adjusting the gain of the amplifier module assembly; and

second transformer tuning means including first and second tuning screws mounted on said one side and juxtaposed said gate transmission line means for adjusting the noise figure of the amplifier module to a minimum value.

4,604,586

AMPLIFIER WITH CURRENT MIRROR CIRCUIT FOR CONTROLLING AMPLIFICATION TEMPERATURE DEPENDENCY

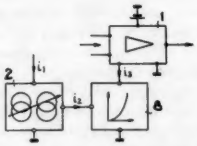
Heinz Rinderle, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 637,033

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329665

Int. Cl.⁴ H03G *3/10*

U.S. Cl. 330—288 **23 Claims**



1. In a circuit arrangement for controlling an amplifier which effects amplification of electric signals, the amplifier having a current controllable amplification, the circuit ar-

rangement comprising an electronic amplification control, wherein there is provided for the amplification control a current mirror circuit by means of which the temperature dependency of the amplification is adjustable, the improvement wherein said current mirror circuit comprises:

first and second transistors;

input means connected for supplying to said first transistor an input current for controlling the amplification of the amplifier;

output means connected to said second transistor for providing an output current derived from the input current;

current supply means connected to said output means for causing the amplification to be adjusted as a function of the value of the output current; and

voltage supply means connected to at least one of said transistors for causing the base-emitter voltage of said first transistor to differ from the base-emitter voltage of said second transistor by a selected amount which is substantially independent of the input current value and which creates a selected temperature-dependent relation between the input current and the output current so that the amplification is controlled by the input current.

4,604,587

TUNABLE MAGNETRON WITH INTERNAL TUNING MOTOR

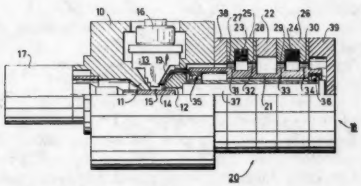
Tord S. Gunnarsson, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 1, 1984, Ser. No. 636,536

Claims priority, application Sweden, Aug. 5, 1983, 8304289

Int. Cl.⁴ H03B *9/100*

U.S. Cl. 331—90 **4 Claims**



1. A tunable magnetron, comprising:

a magnetron having an interaction space, a tuning cavity communicating with said space, and an evacuated chamber communicating with said tuning cavity,

a rotatable tuning body having an active part projecting into said tuning cavity, arranged such that tuning frequency of the magnetron is a function of the instantaneous angular position of the tuning body, and

electric motor means for driving said tuning body,

characterized in that said electric motor means comprises a motor having a rotor and a stator, said rotor being situated entirely within said evacuated chamber and integrated with said tuning body,

said magnetron comprises a vacuum-tight envelope, said motor stator being fixed with respect to said envelope, and

said stator comprises electrical excitation coils, and said rotor is electromagnetically coupled solely by magnetic flux coupling to said stator, said rotor and said stator being arranged such that the relative angular position of the rotor with respect to the stator is entirely determined by electrical excitation of the stator coils, whereby said motor is a position motor and the magnetron frequency is determined entirely by the instantaneous electrical excitation of the coils.

4,604,588

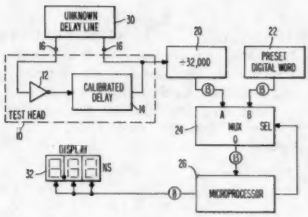
DIGITAL DELAY LINE TESTER

Thomas N. Webler, West Chester, and William A. Lacher, Lansdale, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 12, 1985, Ser. No. 711,058

Int. Cl.⁴ G01R *25/00*

U.S. Cl. 331—135 **11 Claims**



1. A tester for measuring the value of the delay present in an unknown delay line comprising:

a test head having a free-running square wave oscillator configured in a circuit loop, means for selectively coupling said unknown delay line into said circuit loop, said oscillator including inverter means and having oscillator fine-tuning means for effecting a predetermined calibration frequency in the absence of said unknown delay line in said circuit loop, means for determining the frequency of the square wave signals generated by said oscillator,

whereupon the coupling of said unknown delay line into said circuit loop causes the frequency of said oscillator to change from said calibration frequency to a measured frequency in direct proportion to the value of the delay introduced into said circuit loop by said unknown delay line, said last mentioned value being equal to one half of the difference in the periods of the respective square wave signals at said calibration and measured frequencies.

4,604,589

HIGH FREQUENCY CIRCUIT

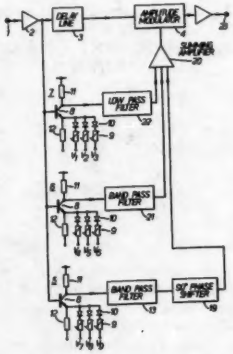
Melvyn McGann, Chelmsford, United Kingdom, assignor to The Marconi Company Limited, Stanmore, Middlesex, England

Filed Dec. 10, 1984, Ser. No. 680,293

Claims priority, application United Kingdom, Jan. 19, 1984, 8401384

Int. Cl.⁴ H03C *1/06*; H03F *3/68*

U.S. Cl. 332—37 R **15 Claims**



1. A high frequency correction circuit including means for receiving a wideband high frequency signal, and for routing it

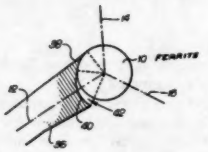
via a delay device to an amplitude modulator; a level dependent detector to which the received signal is applied, and which modifies the amplitude of the signal in a manner which is itself dependent upon the amplitude; a broadband 90° phase shifter arranged to receive the amplitude modified signal and the output of which is fed to the amplitude modulator so as to adjust the phase of said received signal which is routed to it via the delay device.

4,604,590

MICROSTRIP CIRCULATOR STRUCTURE

Mitchell J. Mlinar; Kenneth Louie, both of Torrance, and Wieslaw S. Piotrowski, Los Angeles, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Aug. 24, 1984, Ser. No. 643,924
Int. Cl.⁴ H01P *1/387*
U.S. Cl. 333—1.1 **4 Claims**



1. A microstrip circulator structure, comprising:

a metalized ferrite element of generally cylindrical shape; and

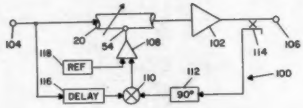
a plurality of microstrip transmission lines, radially oriented with respect to the ferrite, the ends of the microstrip lines adjacent to the ferrite being shaped to achieve magnetic and electrical matching over a wide range of frequencies, and wherein the end of each microstrip line includes a first arcuate portion extending from one edge of the microstrip line, to provide for tangential launching of energy into the ferrite, and in contact with the metalized ferrite, to provide a desirably low coupling angle with the ferrite, and a second arcuate portion contiguous with the first, and spaced from the ferrite, but sufficiently close to provide for magnetic coupling between the microstrip and the ferrite over a relatively wide angle, and thereby meeting its impedance matching requirements.

4,604,591

AUTOMATICALLY ADJUSTABLE DELAY CIRCUIT HAVING ADJUSTABLE DIODE MESA MICROSTRIP DELAY LINE

Carmine F. Vasile, Huntington, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,181
Int. Cl.⁴ H03H *9/38, 11/20*
U.S. Cl. 333—18 **8 Claims**



1. A microwave circuit including a microwave circuit input port and a microwave circuit output port and having a fixed delay, said microwave circuit comprising:

(a) a first amplifier having an input port and an output port, said output port of the first amplifier being the microwave circuit output port;

(b) a variable microwave delay circuit having an input port, a control port and an output port connected to the first amplifier input port, said variable delay circuit including a plurality of varactor diodes and means for applying a bias voltage to individual ones of said diodes, said input port of the delay circuit being the microwave circuit input port;

(c) a fixed delay circuit having an input port connected to the variable microwave delay input and an output port;

(d) a phase shifter having an input port connected via a coupler to the first amplifier output port and an output port;

(e) a mixer having a first input port connected to the fixed delay output port, a second input port connected to the phase shifter output port and an output port;

(f) a reference voltage source; and

(g) a second amplifier having a first input port connected to said reference voltage source, second input port connected to the mixer output port and an output port connected to the variable delay control port whereby varying the reference voltage the variable microwave delay circuit functions to increase or decrease delay to compensate for decreases or increases in transit time through the first amplifier thereby maintaining a constant delay between the variable delay input port and the first amplifier output port; said variable delay circuit comprising:

(1) a substrate;

(2) a plurality of gallium arsenide mesas developed upon said substrate;

(3) a metallized layer disposed on and supported by said substrate as to encircle each of said mesas, said layer including a set of apertures disposed about corresponding ones of said mesas for electrically insulating individual ones of said mesas from said layer;

(4) each of said mesas having an electrically conducting post extending therefrom to provide capacitance through the mesa between the conducting post and said metallized layer;

(5) a stripline conductor serially interconnecting the posts of respective ones of said mesas and being insulated from said metallized layer, the inductance of said conductor coacting with the capacitance of each of said measa to provide a delay to signals propagating along said conductor;

(6) the variable delay circuit input port being one end of the stripline conductor;

(7) the variable delay circuit output port being the other end of the stripline conductor; and

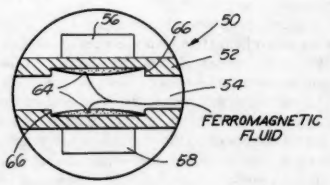
(8) means for applying a bias voltage via said stripline conductor to each of the individual ones of mesas to adjust capacitance provided to said stripline circuit, the variable delay circuit control port being the means for applying.

4,604,592

ELECTRICALLY CONTROLLED RADIO FREQUENCY TUNER

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 19, 1984, Ser. No. 602,207
Int. Cl.⁴ H01P *1/20, 1/23*
U.S. Cl. 333—24.1 **8 Claims**



1. An electrically controlled radio frequency tuner for elimi-

nating a transmitted signal reflection and circulator feedthrough, the tuner comprising:

an elongated waveguide housing having a cavity along the length thereof;

a pair of first and second magnets attached to the exterior of the housing and disposed in a spaced relationship to each other and along the length of the housing;

ferromagnetic fluid disposed inside the cavity of the housing and held therein by the magnetic forces of the first and second magnets; and

a third and fourth magnet attached to the exterior of the housing and adjacent the first and second magnets, the third and fourth magnets, when energized, aligning the ferromagnetic fluid inside the cavity for partially blocking to fully blocking the cavity and thereby setting up a measured reflection for cancelling the undesired reflection and circulator feedthrough.

4,604,593

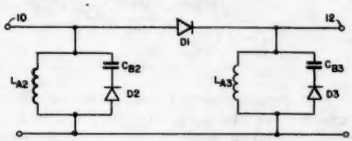
π-SECTION DIGITAL PHASE SHIFTER APPARATUS

Binboga S. Yarman, Istanbul, Turkey, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1985, Ser. No. 767,455

Int. Cl.⁴ H03H *7/20*; H01P *1/185*

U.S. Cl. 333—139 **8 Claims**



1. An extra high frequency π-section digital phase shifter apparatus comprising in combination:

a first diode means, the anode of said first diode means forming an input terminal for an RF signal, the cathode of said second diode means forming an output terminal, said first diode means having a first and second state,

a first shunt circuit comprising a first inductor means in parallel with first capacitor means which is in series with a second diode means, one end of said first inductor means connected to one end of said first capacitor means to form a first junction, said first junction connected to said input terminal, the other end of said first inductor means connected to one end of said second diode means to form a second junction, said second junction connected to ground, said second diode means having a first and second state, and,

a second shunt circuit comprising a second inductor means in parallel with second capacitor means which is in series with a third diode means, one end of said second inductor means connected to one end of said second capacitor means to form a third junction, said third junction connected to said output terminal, the other end of said second inductor means connected to one end of said third diode means to form a fourth junction, said fourth junction connected to ground, said third diode means having a first and second state.

4,604,594

SURFACE WAVE FILTER HAVING PHOTORESIST DAMPING MATERIAL THEREON AND METHOD FOR MANUFACTURING THE SAME

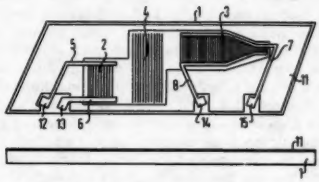
Heinrich Angerer, and Badri Sinha, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 15, 1983, Ser. No. 532,721

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1982, 3234955

Int. Cl.⁴ H03H *9/145, 9/25*

U.S. Cl. 333—194 **11 Claims**



1. In a surface wave filter with a wafer-shaped substrate formed of monocrystalline piezoelectric material having a surface, input and output transducers disposed on the surface of the substrate, a coupler for coupling the transducers, said coupler being spaced apart from the transducers on the surface of the substrate, and electric conductor leads being connected to the transducers on the surface of the substrate and having respective electrodes, the improvement comprising a damping layer formed of photoresist material having a plastic base covering substantially the entire surface of the perimeter of the substrate except for a region bounded by the perimeter of the transducers, the coupler, the respective electrodes of the electric conductor leads and the zones between the transducers and the coupler.

4,604,595

SURFACE ACOUSTIC WAVE DEVICE HAVING INTERDIGITATED COMB ELECTRODES WEIGHTED FOR ODD/EVEN RESPONSE

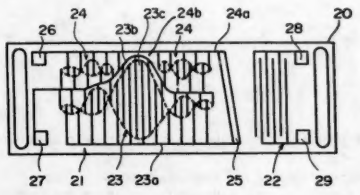
Michio Kadota, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 14, 1983, Ser. No. 504,271

Claims priority, application Japan, Jun. 16, 1982, 57-104391; Dec. 29, 1982, 57-227919; Dec. 29, 1982, 57-227920

Int. Cl.⁴ H03H *9/25*

U.S. Cl. 333—196 **18 Claims**



1. A surface acoustic wave device, comprising:

(A) a piezoelectric substrate for propagating acoustic waves;

(B) input and output side electrodes disposed on a surface of said substrate and located laterally with respect to one another along a propagating direction of said acoustic waves;

(C) at least one of said input and output side electrodes comprising first and second interdigital electrodes:

(i) said first interdigital electrode including a pair of comb

electrodes, each of said comb electrodes of said first interdigital electrode including a respective common electrode extending generally along said propagating direction and a plurality of electrode fingers coupled thereto, each of said electrode fingers extending in a direction generally perpendicular to said propagating direction, each of said fingers overlapping adjacent fingers of the remaining comb electrode of the pair, the overlapping length of adjacent fingers being so weighted as to define one of odd and even components of a desired frequency characteristic, said first interdigital electrode lying within an imaginary rectangle whose length is defined by the distance between the most distant electrode fingers of said first interdigital electrode as measured in said propagating direction and whose width is defined by maximum distance between said common electrodes as measured along said direction perpendicular to said propagating direction;

(ii) said second interdigital electrode including a pair of comb electrodes, each of said comb electrodes including a respective common electrode extending generally along said propagating direction and a plurality of electrode fingers coupled thereto, said electrode fingers extending in a direction generally perpendicular to said propagating direction, each of said fingers of said second interdigital electrode overlapping adjacent fingers of the remaining comb electrode of said second interdigital electrode, the overlapping length of adjacent fingers being so weighted as to define the other of said odd and even components of said desired response frequency characteristic, said overlapping portions of said electrode fingers of said second interdigital electrode lying entirely within said imaginary rectangle but outside said overlapping region of said fingers of said first interdigital electrode.

4,604,596

REMOTELY CONTROLLABLE CIRCUIT BREAKER

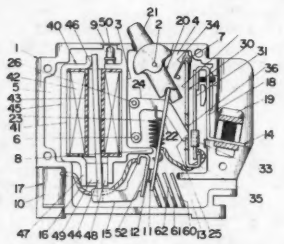
Yoichi Yokoyama, Itami, and Hideya Kondo, Yahata, both of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Sep. 5, 1985, Ser. No. 772,912

Claims priority, application Japan, Feb. 1, 1985, 60-18942; Jul. 12, 1985, 60-154455; Jul. 24, 1985, 60-163634

Int. Cl.[4] H01H *75/00*

U.S. Cl. 335—14 **12 Claims**



1. A remotely controllable circuit breaker comprising in combination:

a single set of first and second contacts;

a manually operable switching mechanism for opening and closing the contacts, said manual switching mechanism including a manual handle movable between an ON position and OFF position and including a movable arm carrying the first contact which arm is operatively connected to the manual handle to be actuated thereby between an ON condition and an OFF condition for bringing the first contact into and out of contacting engagement with the second contact;

a trip mechanism operatively connected to the manually operable switching mechanism so as to open the contacts upon the occurrence of predetermined fault current conditions flowing through the breaker;

a remotely controllable switching mechanism for forcibly opening and closing the contacts in response to a remote control signal;

said second contact being movable between an operative position where it is in electrical contacting engagement with the first contact of the movable arm in the ON condition and an inoperative position where it is away from the first contact independently of the conditions of the movable contact arm; and

said second contact being operatively connected to said remotely controllable switching mechanism in such a way as to be moved between the operative and the inoperative positions by the latter receiving the remote control signal.

4,604,597

SOLENOID SWITCH SUITABLE FOR MOTOR STARTERS

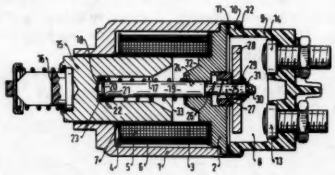
Karl-Heinz Bögner, Neuhausen, and Klaus Bolenz, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 515,611, Jul. 20, 1983, abandoned. This application Mar. 15, 1985, Ser. No. 712,912

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 8221714[U]

Int. Cl.[4] H01H *67/02*

U.S. Cl. 335—127 **10 Claims**



1. Solenoid switch suitable for starter circuits for internal combustion engines, having a casing of ferromagnetic material, a nonmagnetic guiding sleeve therein, an excitation winding mounted on said sleeve with a winding support, a magnet armature guided in said sleeve, a magnet core disposed at an open end of said casing against which said magnet armature is attractable magnetically against the force of a return spring bearing against said magnet core, a contact bridge carrier (28) guided movably in said magnet core by means of a longitudinally movable switch rod having a first end near which said carrier is mounted thereon, and having also a second end opposite the first, said switch rod extending through an aperture in said magnet core, said carrier being displaceable away from a stop therefor on said first end of said switch rod against the force of a contact pressure spring, said switch rod together with said contact bridge carrier seating a contact bridge in a switching space covered by a cap in which two main current contacts are disposed which project into the switching space, said solenoid switch further embodying the improvement which comprises:

stop means (21; 35; 37), against which said return spring bears, located at said second end of said switch rod (19; 34; 36), said magnet armature (15) having a bore (17) in which said second siwtch-rod end is inserted, said stop means having a configuration for centering said switch rod second end in said bore, said contact bridge carrier (28) being thus subject to be pulled away form said two main contacts (13, 14) solely by the force of said return spring (33) immediately upon interruption of current flow in said winding and said return springs (33) thereby able to apply its full force simultaneously to both said switch rod (19)

and said armature (**15**) for returning them both while in mutual abutement in a concurrent movement in which they travel equal distance to their respective rest positions.

4,604,598

ELECTROMAGNETIC RELAY WITH UNDERSLUNG ARMATURE

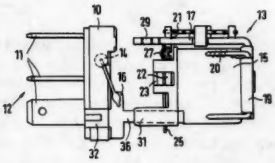
Joachim Naser, Nuremberg; Olaf Schmid, Schwabach; Gerhard Schmidt, Weihenzell; Theodor Sturm, Sachsen, and Berthold Walter, Oberasbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 13, 1985, Ser. No. 733,527

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423270

Int. Cl.[4] H01H *67/02*

U.S. Cl. 335—128 **10 Claims**



1. Electromagnetic relay comprising a base plate of insulating material in which are anchored connection prongs extending therebeneath, a preassembled magnetic system including an L-shaped magnet yoke, a winding core, a spool carried by said core, a winding on said spool, and a flap-type armature swingably mounted at a first end thereof on said magnet yoke; at least one switch contact mounted on said armature at a second end thereof opposite said first end, at least one contact fixed on said base plate for cooperation with said at least one switch contact, said preassembled magnetic system being fastened to said base plate by stamped out anchoring portions of said magnet yoke, and further comprising;

a seat (**21**) for said armature (**22**) formed on an end face of said magnet yoke (**17**) for seating said armature, in a manner suitable for testing said preassembled magnetic system, in a location which is defined on said magnetic yoke (**17**) without regard to whether said yoke is anchored on said base plate (**10**),

said anchoring portions (**29**) of said magnet yoke (**17**) being located adjacent said armature seat (**21**) and so set in corresponding cavities (**30**) in said base plate (**10**) that said core (**18**) carrying said spool (**19**) is disposed perpendicularly to, above, and spaced from said base plate, and so that said armature (**22**) is seated so as to be between said base plate (**10**) and a free end (**18***a*) of said core directed towards said base plate (**10**).

4,604,599

ELECTROMAGNET COMPRISED OF YOKES AND AN ARMATURE SUPPORTING A PERMANENT MAGNET FITTED ON ITS POLE FACES WITH POLE PIECES THAT PROJECT FROM THE AXIS OF THE MAGNET, THIS AXIS BEING PERPENDICULAR TO THE DIRECTION OF MOVEMENT

Gérard Koehler, Ville d'Avray, France, assignor to La Telemecanique Electrique, Nanterre, France

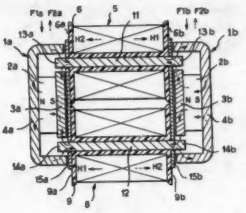
Filed Nov. 1, 1984, Ser. No. 668,164

Claims priority, application France, Nov. 16, 1983, 83 18184

Int. Cl.[4] H01F *7/08*

U.S. Cl. 335—230 **10 Claims**

1. An electromagnet comprising yokes (**11, 12; 31, 32***a*; **51, 52; 71, 72; 91, 92**), an armature (**1***a*, **21***a*, **41***a*, **61***a*, **81***a*) moveable in relation to each other, and a winding (**5, 25, 45, 65, 85**) surrounding a portion of a magnetic circuit, said armature (**1***a*, **21***a*, **41***a*, **61***a*, **81***a*) comprising a permanent magnet (**2***a*, **22***a*, **42***a*, **62***a*, **82***a*) fitted on its two pole faces with two pole pieces (**3***a*, **4***a*; **23***a*, **24***a*; **43***a*, **44***a*; **63***a*, **64***a*; **83***a*, **84***a*) projecting beyond both extremities of the axis of this permanent magnet, at least one (**4***a*, **24***a*, **44***a*, **64***a*, **84***a*) of these said pole pieces having bent extremities to define with the other pole piece (**3***a*, **23***a*, **43***a*, **63***a*, **83***a*) two air gap zones within which penetrate the extremities of the yokes (**11, 12; 31, 32***a*; **51, 52; 71, 72; 91, 92**) in such a way that each air gap zone is made up of two air



gaps inducing counter forces along a direction perpendicular to the principal axis of the permanent magnet (**2***a*, **22***a*, **42***a*, **62***a*, **82***a*), characterized by the fact that at least one second armature (**1***b*, **21***b*, **41***b*, **61***b*, **81***b*) of the same shape as the first (**1***a*, **11***a*, **61***a*, **81***a*) is arranged in parallel with and facing the first, and that two yokes (**11, 12; 31, 32***a*, **32***b*; **51, 52; 71, 72; 91, 92**) join the air gap zones of the two armatures located facing one another in such a way that the magnetic circuit will be formed by a sequence of armature and yoke.

4,604,600

SOLENOID CONSTRUCTION AND METHOD FOR MAKING THE SAME

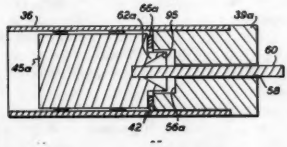
Bruce D. Clark, Clifton Springs, N.Y., assignor to G. W. Lisk Company, Inc., Clifton Springs, N.Y.

Continuation-in-part of Ser. No. 563,891, Dec. 23, 1983, Pat. No. 4,539,542. This application Jun. 3, 1985, Ser. No. 740,640

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.[4] H01F *7/08*

U.S. Cl. 335—261 **33 Claims**



1. An assembly for use in a solenoid comprising:

a. a hollow solenoid armature tube adapted to be received in a solenoid coil, said tube having an armature chamber therein;

b. a stationary pole piece member fixed in and defining one end of said armature chamber;

c. an armature member positioned in said armature chamber of said tube for axial sliding movement relative to and defining an armature stroke relative to said pole piece member;

d. one of said members having an axially extending recess therein and the other member having a reduced in cross section end portion adapted to be received in and complementary to said recess;

e. said other member having a radially internally facing frusto-conical surface formed on said reduced in cross section end portion and disposed within said recess;

f. said armature tube having a non-magnetic section defining

a reduced magnetic gap extending coaxially with at least a portion of said armature stroke sufficient to permit selected magnetic forces to be produced on said armature; and

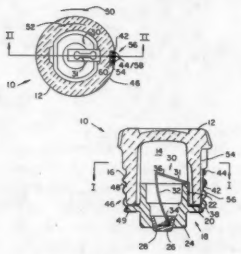
g. said armature tube providing concentricity of said two members.

4,604,601

ELECTRIC PLUG FUSE WITH CORRUGATED ELEMENT

Terry R. O'Brien, Brampton, Canada, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jul. 30, 1985, Ser. No. 760,365
Int. Cl.[4] H01H *85/16*
U.S. Cl. 337—261 **3 Claims**



1. An electric plug type fuse including a substantially cylindrical hollow glass body defining a cavity and being screw threaded on the outer surface thereof, a contact button support of an electric insulating material of which one end projects into the cavity and the other end projects away from the cavity to the outside thereof, a contact button on the outer end of the contact button support, a metal shell overlapping the contact button support, the metal shell being screw threaded, and the screw threads thereof mating with the screw threads on the glass body, the glass body having a groove on the outer surface thereof extending perpendicular to and interrupting the screw threads on the glass body, the groove and the metal shell cooperating to define a channel therebetween, a strip-like fusible element having one end thereof conductively connected to the contat button and extending therefrom into the cavity defined by the glass body, the other end of the fusible element extending from the cavity, between the contact button support and the glass body into the channel defined by the groove and the metal shell, where the other end of the fusible element is soldered to the metal shell, wherein the improvement comprises:

forming said other end of said fusible element which extends into said channel into a geometric shape which defines a plurality of substantially separate longitudinal solder receiving cells in said channel between said fusible element and said metal shell.

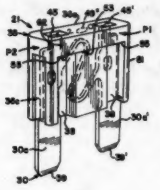
4,604,602

PLUG-IN FUSE ASSEMBLY WITH STACKABLE HOUSING

John Borzoni, Indian Rocks Beach, Fla., assignor to Littelfuse, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 640,841, Aug. 17, 1984. This application Apr. 16, 1985, Ser. No. 722,596
Int. Cl.[4] H01H *85/16*
U.S. Cl. 337—264 **14 Claims**

1. In a plug-in fuse assembly including a housing made of insulating material and including a pair of upwardly extending side walls; and a conductive plug-in fuse element secured in said housing and having laterally spaced, generally parallel confronting terminals at the bottom thereof projecting downwardly from the bottom of said housing, said terminals having upwardly extending current-carrying extensions, and a fuse link extending between said current-carrying extensions; portions of said current-carrying extensions and said fuse link being confronted by said side walls; the improvement wherein each side wall has outermost vertical coplanar wall surfaces parallel to the corresponding outermost vertical coplanar wall surfaces on the opposite side of the housing, said outermost vertical coplanar wall surfaces being adapted to engage the



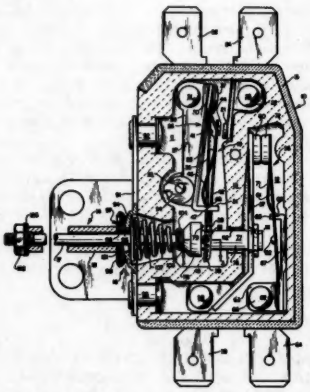
complementary outermost vertical wall surfaces of an identical plug-in fuse assembly placed with the identical orientation beside it, to provide for a stable side-by-side stacking of numbers of identical plug-in fuse assemblies in a stacking hopper or the like, said outermost vertical coplanar wall surfaces of each side wall occupying less than one half the total outer exposed surface area of the housing side wall involved, the remainder of which are recessed within the vertical plane thereof.

4,604,603

DUAL TEMPERATURE THERMOSTAT

Donald E. Place, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Continuation of Ser. No. 590,377, Mar. 16, 1984, abandoned. This application May 20, 1985, Ser. No. 736,297
Int. Cl.[4] H01H *37/48*
U.S. Cl. 337—394 **18 Claims**



1. A thermally responsive switching device comprising a body, a temperature probe providing a tube and a rod extending through said tube wherein said tube and rod are formed of material having different coefficients of thermal expansion, swivel means mounting one end of said tube on said body and permitting swiveling movement of said tube and rod relative to said body, said swivel means including a first member providing a curved surface which is a portion of a sphere, and a second member providing a circular surface engageable and movable along said curved surface, one of said members being supported by said body and providing a first central opening through which said rod projects with substantial clearance, the

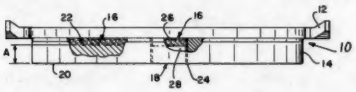
other of said members providing a second central opening through which said rod extends with relatively close clearance, said one end of said tube engaging a substantially flat portion of said second member around said second central opening, the other end of said tube being connected to said rod, spring means connected to said rod operating to tension said rod, bias said one end of said tube against said second member and in turn bias said second member against said first member, swiveling movement of said tubular member causing said rod to engage the sides of said second opening and in turn cause movement of said second member relative to said first member to maintain correct alignment of said second member with respect to said tube and rod, and switch means mounted on said body operated in response to differential thermal expansion and contraction of said rod and tube.

4,604,604

VAPOR EMITTING WEAR INDICATOR

Joseph M. Mann, Ft. Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed Jun. 29, 1984, Ser. No. 625,988
Int. Cl.[4] B60Q *1/00*; G01D *21/00*
U.S. Cl. 340—52 A **12 Claims**



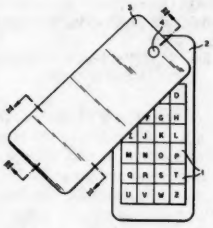
1. A material wear indicator for an erodible structure having a wearable surface comprising:
a vapor emitting means located in said erodible structure in a place beneath said wearable surface corresponding to a selected maximum erosion level of said wearable surface;
said vapor emitting means exuding a specific vapor upon said wearable surface of said structure being sufficiently eroded to expose said vapor emitting means.

4,604,605

SAFETY DEVICE FOR MANUALLY OPERABLE CODE GENERATION

Pierre Meyers, Nimrodstr. 7A, Ottobrunn, and Klaus Meister, Am Fischerwinkel 3, Grünwald, both of Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,052
Claims priority, application Fed. Rep. of Germany, May 10, 1983, 3317112
Int. Cl.[4] G06F *3/02*
U.S. Cl. 340—365 R **12 Claims**



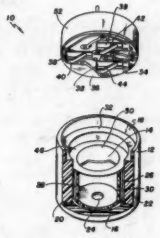
1. In a code generator for the emission of combinations of digital data, comprising a base with a keyboard having manually operable keys with substantially coplanar pressure faces,
the combination therewith of a cover movably secured to said base for overlying said keyboard in a nonoperating position, said cover being provided with wiper means arranged to sweep over said pressure faces upon a displacement of said cover between said nonoperating position and an operating position giving access to said keys, said wiper means carrying a nonvolatile liquid forming a continuous film on said pressure faces upon a sweep thereof by said wiper means.

4,604,606

AUDIO SIGNALLING DEVICE

Louis P. Sweany, Carmel, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 430,869, Sep. 30, 1982, abandoned. This application Aug. 8, 1985, Ser. No. 763,775
Int. Cl.[4] G08B *3/00*; H01L *41/04*
U.S. Cl. 340—384 E **6 Claims**



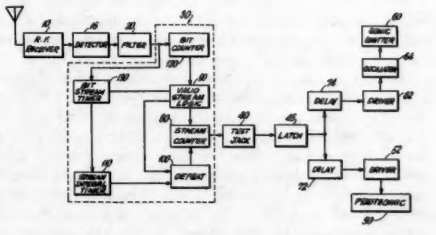
1. An audio signalling device comprising:
a housing having an open and a closed end,
an aperture in said open end,
a piezoelectric transducer,
mounting means for nodally mounting said piezoelectric transducer in proximity to said closed end,
a printed circuit board carried in said housing and spaced from said piezoelectric transducer, said printed circuit board including first and second surfaces, said first surface having electrical circuits carried thereon and said second surface facing said piezoelectric transducer and having soldered electrical connections thereon, and openings extending through said printed circuit board, and
resilient contact means carried on said first surface and extending through said openings for engaging said piezoelectric transducer.

4,604,607

SECURITY DEVICE SIMULATING CURRENCY PACK OR THE LIKE

Hugh B. Sanderford, Jr., and John R. Souvestre, both of Metairie, La., assignors to Protection Products Corporation, New Orleans, La.

Filed Dec. 27, 1979, Ser. No. 107,527
Int. Cl.[4] G08B *1/08*
U.S. Cl. 340—539 **16 Claims**



1. A security device adapted to be secreted within a package simulating a currency pack or the like for foiling unauthorized

removal of said package passed a local electromagnetic carrier signal carrying information in a predetermined binary code, said binary code including a predetermined number of streams of serial data bits, said streams each being of a predetermined duration with a predetermined number of data bits and being separated from one another by predetermined time intervals, said device comprising:

means for receiving selectively signals in the frequency range of said carrier signal;

means connected to said receiving means for detecting information carried by the received signal and producing information signals in binary form in response thereto;

logic means for receiving said information signals and producing a validation signal upon receipt of information signals conforming to said predetermined binary code; and

foiling means for receiving said validation signal and activating at least one means discouraging continued removal of said package.

4,604,608

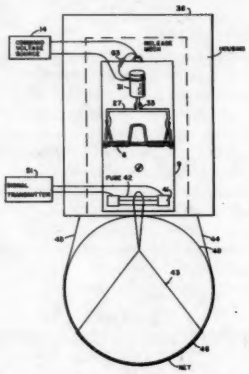
POSITIVE ACTION RELEASE MECHANISM

Ernest J. Franchi, Kwajalein, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 14, 1985, Ser. No. 711,877

Int. Cl.[4] G08B *21/00*; G01W *1/08*

U.S. Cl. 340—540 **3 Claims**



1. A system comprising a lever, biasing means connected to said lever so as to bias the lever to move in a predetermined direction, a platform positioned to hold said biasing means and said lever, an electrical element mechanically connected to said lever and to said platform so as to prevent said lever from moving in said predetermined direction, an electrical supply means connected across said electrical element such that when said electrical supply means is in an on condition, the electrical element will be caused to fracture and release said lever from movement in said predetermined direction, a breakable means connected to said platform, said breakable means being positioned such that when said lever is allowed to move in said predetermined direction said lever will make contact with said breakable means and cause breakable means to break, a load means which is desired to be released when said electrical supply means is in an on condition, said load means being tied down to said breakable means such that when said breakable means is broken said load means will be released, a signal generating means attached to said breakable means such that when said breakable means breaks said signal generating means will give an indication of that event, and said breakable means is a glass fuse mounted on said platform with electrical connections to said signal generating means.

4,604,609

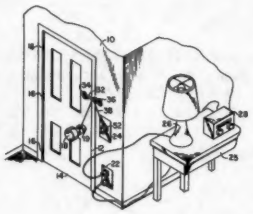
SECURITY SYSTEM

George H. Wakefield, Jr., 85 W. First St., Lake Ronkonkoma, N.Y. 11779

Filed Mar. 21, 1985, Ser. No. 714,470

Int. Cl.[4] G08B *13/12*

U.S. Cl. 340—548 **7 Claims**



1. In combination with a door having a knob mounted in the doorway of a wall, a security arrangement comprising an elongated, rigid member having a fixed loop at one end and a latched loop at the other end, first loop means mounted on said door adjacent the side of said door which swings open adapted to engage one of the loops of said elongated member, second loop means mounted on said wall adjacent said first loop means for engaging the other loop of said elongated member, so that when said door is closed said elongated member may be engaged with the loops mounted on said door and said wall, string means tied at one end to said door knob and stretched taut over said elongated member, and means for engagement with the other end of said string means for producing an alarm when the tension in said string means is increased due to an attempted opening of said door causing said elongated member to move.

4,604,610

SWIMMING POOL ALARM

Robert W. Baker; Dean Donely, both of Scarborough, and Vlado Odorcic, Willowdale, all of Canada, assignors to Nathan I. Hennick, Toronto, Canada

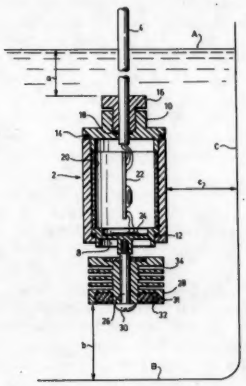
Filed Feb. 11, 1985, Ser. No. 700,499

Int. Cl.[4] G08B *13/00*

U.S. Cl. 340—566 **7 Claims**

1. A swimming pool alarm apparatus comprising a triggerable alarm device, a transducer head incorporating an audio frequency transducer element, means to support said transducer head for submersion in and acoustically coupled to the water of a swimming pool, at a location clear of any wall of the latter and at a epth of at least 30 cm, and a sensor element hydraulically coupled to the water of the pool and mechanically couple for transmission of impulses to the transducer element through lost motion means permitting limited vertical movement of the sensor element relative to the transducer element, the sensor element having a mean density differing only slightly from that of the pool water, and amplifier means coupling said transducer head to said triggerable alarm device whereby to trigger the latter only in the event of the transducer head output reaching a predetermined level, whether in

response to sounds acoustically coupled to said transducer element, or to wave motions hydraulically coupled to said



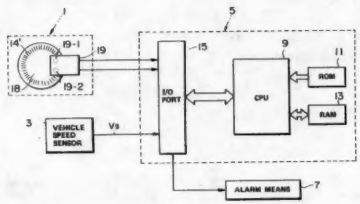
sensor element and causing transmission of impacts to said transducer element.

4,604,611

SYSTEM AND METHOD FOR DETECTING DRIVER DROWSINESS INCLUDING DETECTION OF STEERING ROTATION AND REVERSAL

Yasutoshi Seko, Yokohama; Haruhiko Iizuka, Yokosuka; Takayuki Yanagishima, Yokosuka, and Hideo Obara, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 15, 1984, Ser. No. 580,175
Claims priority, application Japan, Feb. 18, 1983, 58-24605
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—576 **14 Claims**



14. A method for detecting driver drowsiness in an automotive vehicle, comprising the steps of:

(a) determining whether a number of pulses within a first duration interval of time exceeds a first reference value, each of the pulses being produced whenever a steering wheel of the vehicle is rotated through a predetermined angle, each pulse indicating the direction of rotation of the steering wheel;

(b) determining whether the number of steering reversals within a first duration interval of time is below a second reference value, each steering reversal being detected when one of said pulses and the subsequent pulse thereto are derived from different rotational directions of the steering wheel; and

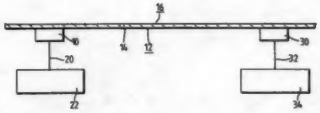
(c) producing an alarm when the number of pulses within a first duration interval of time exceeds said first reference value determined in said step (a) and the number of steering reversals within said first duration interval of time is below said second reference value determined in said step (b).

4,604,612

ICE DETECTOR

Roger D. Watkins, Wantage; Arthur B. Gillespie, Abingdon; Michael O. Deighton, Reading; Roger B. Pike, Newbury, and Colin B. Scott-Kestin, Reading, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jul. 22, 1983, Ser. No. 516,262
Claims priority, application United Kingdom, Aug. 3, 1982, 8222419; Dec. 16, 1982, 8235668
Int. Cl.[4] G08B *19/02*; G01H *3/12*; H04R *15/00, 17/00*
U.S. Cl. 340—582 **14 Claims**



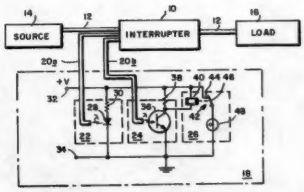
1. A method for detecting ice on a surface of a thin solid sheet comprising, energising a transducer to cause propagation through a portion of the sheet of ultrasonic waves having their predominant component parallel to the surface of the sheet, detecting the waves by means of a second transducer, measuring the amplitude of the waves received by the second transducer, and detecting by means of the amplitude of the waves received by the second transducer the presence of a layer of ice on the surface of the portion of the sheet.

4,604,613

STATUS-INDICATING CURRENT INTERRUPTER

Thomas F. Clark, Canton, Mass., assignor to Phoenix Electric Corporation, Boston, Mass.

Filed Jun. 18, 1984, Ser. No. 621,540
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—638 **11 Claims**

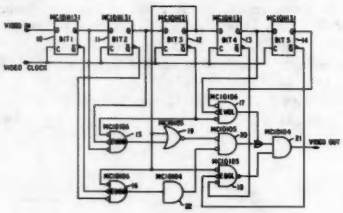


6. A high voltage current limiter providing an indication of current flow therethrough, comprising a housing enclosing an interruptable path extending therethrough and having an input port and an output port means, including fiber optic cable extending through said housing for defining a light path extending between the input port and the output port for carrying an optical signal indicative of the status of current flow through said current path, and an explosive charge for interrupting said light path on interruption of current flow through said current path to establish a failure-indication signal.

4,604,614
VIDEO DISPLAY SYSTEM EMPLOYING PULSE STRETCHING TO COMPENSATE FOR IMAGE DISTORTION

Robert W. E. Farr, Allbrook, and Ian D. Judd, Chandler's Ford, both of England, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 26, 1983, Ser. No. 536,116
Claims priority, application European Pat. Off., Sep. 29, 1982, 82305176.8
Int. Cl.⁴ G09G *1/06*
U.S. Cl. 340—728 **4 Claims**

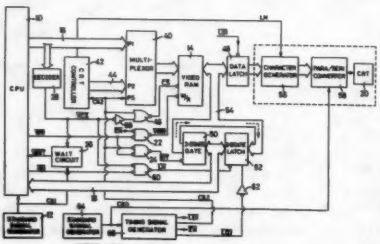


1. A video display system of the kind in which at least one visible characteristic of consecutive image points on the screen of a raster-scan CRT is defined by the values of consecutive pels of a digital video drive waveform, each such pel comprising one or a plurality of video bits in parallel, and in which a pulse stretching circuit is provided for extending the duration of selected pels in the video waveform in order to at least partially compensate for image distortion introduced by the finite video amplifier rise and fall times of the CRT, characterized in that the pulse stretching circuit comprises, decoding means for examining each pel at least in relation to its two immediate neighbors on either side in order to detect predetermined relationships between the values of the pels, and retiming means for selectively advancing or delaying the time of transitions between consecutive pels of different value in accordance with the relationships so detected.

4,604,615
IMAGE REPRODUCTION INTERFACE

Yasuhiro Funahashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 28, 1983, Ser. No. 546,424
Claims priority, application Japan, Nov. 6, 1982, 57-195055
Int. Cl.⁴ G09G *1/24*
U.S. Cl. 340—750 **4 Claims**



1. An image reproduction interface disposed between a central processing unit, and a display device having a control unit and a screen on which an image is reproduced, comprising:

a video random-access memory for temporarily storing code signals corresponding to respective ones of a multiplicity of image elements available for reproduction on said display device;

a multiplexor for alternately selecting, for a first time period, an address bus through which first address signals are transferred from said central processing unit to said video random-access memory to designate memory locations at which said code signals are stored, and for a second time period, a refresh address bus through which second address signals are transferred from said control unit of the display device to said video random-access memory to sequentially designate said memory locations from which said code signals are read out to reproduce the image on said display device, a sum of said first and second time periods being equal to a reproduction interval at which said image elements are sequentially reproduced;

latch means, operative during said second time period, for reading out from said video random-access memory one of said code signals which has been stored in the memory location designated by the second address signal transferred through said refresh address bus, and applying the read-out code signal to said display device for a period of said reproduction interval while latching said read-out code signal for the period of said reproduction interval;

gate means, operative during said first time period, for permitting the code signal from said central processing unit to be temporarily stored in the memory location of said video random-access memory designated by the first address signal transferred through said address bus;

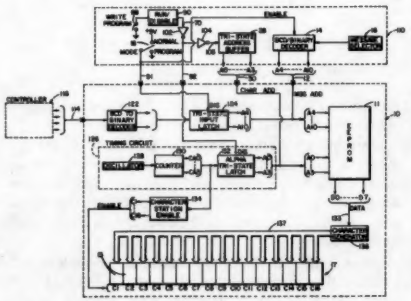
said central processing unit generating a first command signal to enable the code signal to be stored in said video random-access memory through said gate means during an access-ready time which is a portion of said first time period and during which said video random-access memory is accessible for storage of said code signal; and

wait-signal generating means for applying a wait-signal to said central processing unit, said wait-signal holding said first command signal active for a length of time sufficient to overlap with an entire length of said access-ready time.

4,604,616
APPARATUS FOR PROGRAMMING AN ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY

Gerald L. Buchas, Bristol, Conn., assignor to The Arthur G. Russell Company, Incorporated, Bristol, Conn.

Filed Dec. 1, 1983, Ser. No. 557,192
Int. Cl.⁴ G09G *3/04*
U.S. Cl. 340—756 **7 Claims**



1. Apparatus for programming an electrically erasable programmable read-only-memory (EEPROM) semi-conductor memory device wherein said EEPROM is part of an alphanumeric display system having a multi-character station visual display device for displaying message units each made up of a plurality of characters wherein each character of the message

unit is stored at an adressable character location as a byte of data in cells of said EEPROM, said EEPROM having a plurality of address terminals divided into two groups where one group is energized by a binary coded message unit address signal to address any one of a plurality of message units into which the stored characters are divided and the other group is energized by a binary coded character address signal to address any one of the character locations of the addressed message unit, said display system also including a first message unit addressing means for generating a message unit address signal to address one of the message units of said EEPROM, and said display system further including a first character addressing means for generating a character address signal to address one of the characters of the addressed message unit of said EEPROM, said apparatus comprising:

second message unit addressing means for generating a message unit address signal to address one of the message units of said EEPROM;

means for selectively connecting or disconnecting said EEPROM to or from said first message unit addressing means and for simultaneously disconnecting or connecting said EEPROM from or to said second message unit addressing means so that stored message units are addressed by one or the other of said first and second message unit addressing means;

second character addressing means for generating a character address to address one of the character storage locations of the addressed message unit;

means for selectively connecting or disconnecting said EEPROM to or from said first character addressing means and for simultaneously disconnecting or connecting said EEPROM from or to said second character addressing means so that character storage locations are addressed by one or the other of said first and second character addressing means;

means for comparing a character address generated by said first character addressing means to a character address generated by said second character addressing means to produce an ADD MATCH signal, said ADD MATCH signal being representative of a character address generated by the first generating means being the same as a character address generated by the second generating means;

means for generating an indicator character signal representative of a cursor in response to the presence of said ADD MATCH signal, said cursor being displayed in the character display station position corresponding to the character address generated by said second character addressing means;

means for conditioning an addressed EEPROM character storage location to receive a data byte;

alphanumeric character generating means associated with the EEPROM programming apparatus for generating a signal representative of an alphanumeric character to be written into an addressed and conditioned EEPROM character storage location, and

storage location altering means responsive to said conditioning means and said programming apparatus alphanumeric character generating means for electrically altering said addressed and conditioned EEPROM character storage location to cause it to retain said signal representative of an alphanumeric character generated by said programming apparatus alphanumeric character generating means.

4,604,617

DRIVING SYSTEM FOR A MATRIX DISPLAY PANEL

Shinji Morozumi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 19, 1983, Ser. No. 524,621

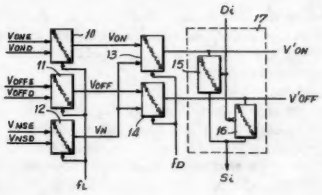
Claims priority, application Japan, Aug. 23, 1982, 57-145942; Oct. 28, 1982, 57-189618

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—805 **8 Claims**

1. A driving circuit for applying a video input signal comprising a plurality of sequential video scanning lines to a matrix display panel having a plurality of data electrodes and a plurality of scanning electrodes arranged in a matrix, a portion of the scanning lines containing significant data signals and another portion containing data signals of little or no significance, the driving circuit comprising:

circuit means for driving said scanning electrodes in sequence and in synchronism with at least a portion of the scanning lines which contain significant data signals while omitting said portion containing data signals of little or no significance;



circuit means for driving said data electrodes with video data from said input signal for display in synchronism with said scanning electrodes; and

circuit means responsive to said input signal for applying substantially equal potentials to said scanning electrodes and to said data electrodes when said scanning lines are omitted, whereby the contrast of the display produced by the display panel is enhanced.

4,604,618

TIME-DIVISION MULTIPLEX TRANSMISSION SYSTEM

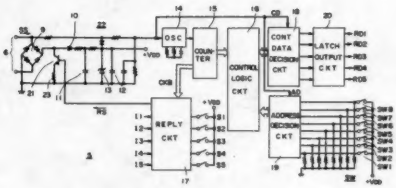
Osamu Akiba, Neyagawa; Yoshiharu Suzuki, Kadoma; Motoharu Terada, Higashiosaka, and Takashi Saeki, Shijonawate, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Apr. 28, 1983, Ser. No. 489,324

Claims priority, application Japan, May 15, 1982, 57-81842

Int. Cl.[4] G05B *23/02*; **H04Q** *9/00*

U.S. Cl. 340—825.06 **8 Claims**



1. A time-division multiplex transmission system comprising:

a host machine;

a signal line connected to said host machine; and

a plurality of addressable terminals connected to objects to be controlled and objects to be monitored, and connected to said host machine by way of said signal line to place the objects to be controlled under centralized control of said host machine and to place the object to be monitored under centralized monitoring of said host machine, said host machine including:

transmission means for transmitting, in a cyclic fashion, a transmission signal including address data for addressing said terminals, control data for controlling the objects to be controlled and reply standby signals for defining a reply standby period during which reply signals, including monitor data, may be received from any of said terminals, the reply standby period being divided into a number of reply blocks; and

first reception means for receiving the reply signals from any of said terminals during the reply standby period and for picking up the monitor data included therein,

each of said plurality of terminals including:

second reception means for receiving the transmission signal transmitted fron said transmission means of said host machine;

address setting means for setting, as a preset address, an address assigned to the terminal, the same address being set for a number of said terminals which is less than the number of the reply blocks;

address decision means, connected to said second reception means and said address setting means, for determining if the address defined by the address data in the received transmission signal corresponds to the present address;

control signal output means, connected to said second reception means and said address decision means, for providing a control signal corresponding to the control data when said address decision means determines that correspondence exists between the addresses;

reply means for receiving from the objects to be monitored a number of monitor data signals, including monitor data, which is less than the number of reply blocks, and for supplying, for at least one preselected reply block, the reply signal including the monitor data; and

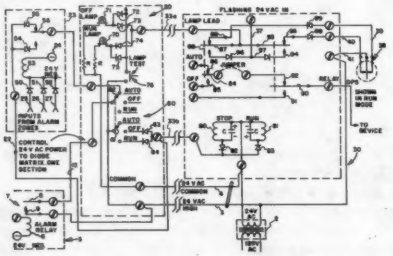
selection means, connected to said reply means, for selecting the at least one preselected reply block for which the reply signal is to be supplied by said reply means, a different one of the reply blocks being preselected for each of said plurality of terminals having the same preset address, by means of said selection means in each of said terminals, a particular object to be monitored being connected to a particular terminal out of said plurality of terminals having the same address, so that the monitor data in the monitor data signal from the particular object can be determined.

4,604,619

APPARATUS AND METHOD FOR MULTIPLE MODE REMOTE CONTROL SWITCHING

Harry C. Goodwater, 450 Ramsell St., San Francisco, Calif. 94132

Filed Sep. 16, 1983, Ser. No. 533,097
Int. Cl.[4] G05B *23/02*
U.S. Cl. 340—825.18 **11 Claims**



1. A remote controlled switching apparatus for controlling the operation of a device having a plurality of modes of operation comprising:

a first switch means having a wiper which is movable between a first and a second position, a first contact adapted to be contacted by said wiper of said first switch means when said wiper of said first switch means is moved from its first to its second position and means for moving said wiper of said first switch means;

a second switch means having a wiper which is movable between a first and a second position, a first contact adapted to be contacted by said wiper of said second switch means when said wiper of said second switch means is in its first position, a second contact adapted to be contacted by said wiper of said second switch means when said wiper of said second switch means is in its second position, a first diode having an anode coupled to said first contact of said second switch means, a second diode having a cathode coupled to said second contact, and means for moving said wiper of said second switch means between said first and said second positions;

a third switch means having a first and a second wiper which are ganged together and movable between a first, a second and a third position, a first contact adapted to be contacted by said first wiper when said first and second wipers are in their first position, a second contact adapted to be contacted by said second wiper when said first and second wipers are in their second position, a third contact adapted to be contacted by said second wiper when said first and second wipers are in their third position, a first diode having a cathode coupled to said second contact, a second diode having an anode coupled to said third contact, and a means for moving said first and second wipers in unison;

a fourth switch means having a wiper which is movable between a first and a second position, a first contact adapted to be contacted by said wiper of said fourth switch means when said wiper of said fourth switch means is in its first position and a second contact adapted to be contacted by said wiper of said fourth switch means when said wiper of said fourth switch means is in its second position, means for coupling said wiper of said fourth switch means to said device, means for coupling said second contact to a source of power, and means, including a diode having a cathode coupled to a relay, for moving said wiper of said fourth switch means;

a fifth switch means having a wiper which is movable between a first and a second position, a first contact adapted to be contacted by said wiper of said fifth switch means when said wiper of said fifth switch means is in its first position and a second contact adapted to be contacted by said wiper of said fifth switch means when said wiper of said fifth switch means is in its second position, means for coupling said first contact to a source of power, means for coupling said wiper of said fifth switch means to said first contact of said fourth switch means, and means, including a diode having an anode coupled to a relay, for moving said wiper of said fifth switch means;

means for coupling said wiper of said first switch means and said first wiper of said third switch means;

means for coupling said first contact of said first switch means to a source of AC power;

means for coupling said first and said second diodes of said second switch means to said diodes in said means for moving said wipers of said fourth and said fifth switch means;

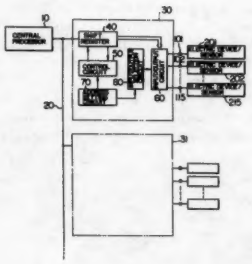
means for coupling said second wiper of said third switch means to said source of AC power; and

means for coupling said first and said second diodes of said third switch means to said diodes in said means for moving said wipers in said fourth and said fifth switch means, such that when a positive potential from said diodes in said second or said third switch means is applied to said diodes in said fourth and said fifth switch means, said wiper in said fourth switch means is moved from its first position to its second position and, when a negative potential from said diodes in said second or said third switch means is applied to said diodes in said fourth and said fifth switch means, said wiper in said fourth switch means is moved from its first position to its second position.

4,604,620
INFORMATION TRANSMISSION SYSTEM

Shigeru Oho, Hitachi, and Takeshi Hirayama, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 7, 1983, Ser. No. 464,212
Claims priority, application Japan, Feb. 8, 1982, 57-17535
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.52 **19 Claims**



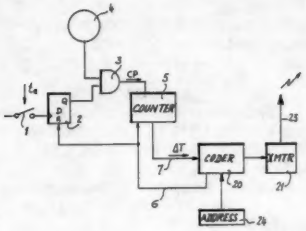
1. An information transmission system comprising:
an addressable terminal device including a plurality of input-/output terminals for inputting and outputting signals;
a central processor for receiving data from said terminal device and for supplying data including address information to said terminal device; and
a transmission line connected between said central processor and said terminal device;
said terminal device including address setting means which is selectively settable for generating signals representing an address for said terminal device, holding means for holding data including address information received from said central processor or data received from said input-/output terminals, comparator means for comparing received address information in said holding means with said generated address signals to determine if said data received from said central processor is to be applied from said holding means to said input/output terminals, and connection means responsive to said comparator means for applying said received data from said holding means to selected ones of said input/output terminals designated on the basis of said generated address signals.

4,604,621
DEVICE FOR THE ELECTROMAGNETIC TRANSMISSION OF AN EVENT TAKING PLACE IN AN INTERFERENCE-LADEN ENVIRONMENT

Max Suter, Dotzigen, Switzerland, assignor to Omega Electronics S.A., Switzerland

Filed May 9, 1984, Ser. No. 608,338
Claims priority, application France, May 13, 1983, 83 08653
Int. Cl.[4] G08C *19/00*; G08B *23/00*; G04F *8/00*
U.S. Cl. 340—825.69 **7 Claims**

1. A device for electromagnetically transmitting, in an environment marked by interference, a sporting event entailing in particular the start of a race in which several racers are involved, said event being defined by a time t_e at which it occurred, characterized by the fact that the device consists of a transmitting mechanism able to transmit a sequence of pulses consecutive to the said event, each of the pulses in the said sequence being marked by a distinctive sign making it possible to situate it in time (ΔT_i) in relation to the said event and by a code making it possible to identify each racer, and of a receiving device which is suitable for detecting the first interference-free pulse of the sequence and which, by considering a current time t_h at the time of detection of the said code, makes it possible in turn to restore the value of the time t_e at which the said

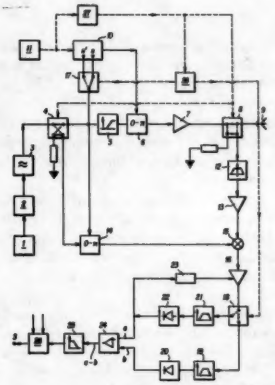


event occurred and the identification of the racer to which the same time t_e belongs.

4,604,622
PROXIMITY RADAR

Patrice C. G. Delon, Neuilly; Gerard D. Fourreaux, Chatou; Michel J. R. Nicolas, Paris, and Bruno R. Sebilet, Suresnes, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A., Paris, France

Filed May 25, 1983, Ser. No. 498,162
Claims priority, application France, Jun. 28, 1982, 82 11268
Int. Cl.[4] G01S *13/32*
U.S. Cl. 343—5 PD **7 Claims**



1. A proximity radar for detecting when the radar is at a predetermined distance from a target, said radar including
means for transmitting towards the target a signal phase modulated in accordance with a pseudorandom sequence of logic bits produced at a control frequency, means for receiving the transmitted signal after reflection from said target,
time delay means for producing an output of a signal corresponding to the transmitted signal which is delayed by a selected time interval,
means for correlating the received signal with the output signal of the time delay means,
an amplifier for amplifying the output of said correlating means,
means for alternately setting said selected time interval to times corresponding to the duration of n and n' bits of said pseudorandom sequence, where n' is less than n and the

duration of n bits corresponds to the time taken for the signal to travel twice said predetermined distance, and

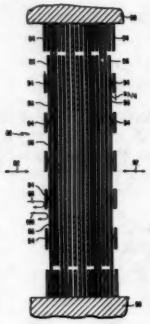
an automatic gain control circuit for controlling said amplifier when said time interval corresponds to n' bits, said automatic gain control device being inoperative when said time interval corresponds to n bits.

4,604,623

SURFACE ACOUSTIC WAVE PASSIVE TRANSPONDER HAVING NON-REFLECTIVE TRANSDUCERS AND PADS

Halvor Skeie, San Jose, Calif., assignor to X-Cyte Inc., Mountain View, Calif.

Filed Jun. 30, 1983, Ser. No. 509,524
Int. Cl.[4] G01S *13/74*
U.S. Cl. 343—6.8 R **8 Claims**



1. In a passive transponder adapted for use in an interrogation system for transmitting a reply signal containing coded information in response to the receipt of an interrogating signal, said transponder comprising:

(a) a substrate having a substrate surface defining a plurality of paths of travel for surface acoustic waves, each path of travel having a different length from its beginning to its end; and

(b) electric circuit means for propagating surface acoustic waves along said paths of travel, from said beginning of each path to said end thereof, said electric circuit means comprising a plurality of metallized layer elements, disposed on said substrate and arranged in said paths of travel;

the improvement wherein at least one of said layer elements has a substantially linear serrated edge on a side thereof facing a path of travel to reduce acoustic wave reflections from said edge, the width of the serration in said serrated edge in the direction of said path of travel being substantially equal to $n\lambda/4$, where n is an odd integer and λ is the center wavelength of said surface acoustic waves.

4,604,624

PHASED ARRAY ANTENNA EMPLOYING LINEAR SCAN FOR WIDE-ANGLE ARC COVERAGE WITH POLARIZATION MATCHING

Noach Amitay, Tinton Falls, and Michael J. Gans, Monmouth Beach, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 16, 1982, Ser. No. 442,237
Int. Cl.[4] H01Q *21/06, 21/24;* H04B *7/10*
U.S. Cl. 343—361 **4 Claims**

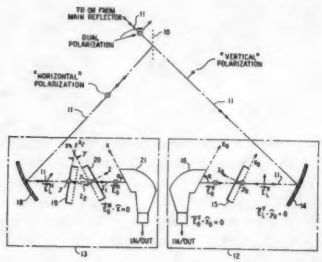
1. An antenna feed arrangement comprising:

a plurality of feed elements arranged in an array and capable of launching or receiving a beam of electromagnetic energy polarized in a first direction, the array including a fixed linear phase taper along a first axis across the aperture of the array to cause the beam to be squinted at an angle 90 degrees-α;

phase shifting means connected to the plurality of feed elements and capable of selectively producing a predetermined linear phase taper along a second axis across the aperture of the array for causing the squinted beam to traverse a predetermined arc in the far field of the antenna arrangement when scanned along the second axis of the array orthogonal to the first axis;

polarization diplexing means capable of bidirectionally directing orthogonally polarized signals along one path in the far field of the antenna arrangement and along first and second separate paths in the near field of the antenna arrangement for interception along the first one of the paths by the array of feed elements;

first polarization rotating means disposed between the diplexing means and the array with the surface normal



vector of the polarization rotating means at an angle to a ray directed from the center of the aperture of the array to the center of the far field of view of the antenna arrangement which substantially corresponds to the angle of squint of the beam generated by the array, the polarization rotating means being capable of rotating a signal polarized in a first direction at the aperture of the array into a signal polarized in a second direction; and

second polarization rotating means disposed between the diplexing means and the first polarization rotating means at a predetermined acute angle γ to the first polarization rotating means, the second polarization rotating means being capable of rotating a signal polarized in the second direction from the first polarization rotating means into a signal polarized in the first direction which is matched to the polarization of the beam received from the diplexing means along the first separate path.

4,604,625

PHASE-LOCKED DIGITAL VERY HIGH FREQUENCY OMNI-RANGE (VOR) RECEIVER

Eldon F. Davidson, 240 Flower Dr., Folsom, Calif. 95630

Filed Jul. 14, 1983, Ser. No. 513,654
Int. Cl.[4] G01S *1/44*
U.S. Cl. 343—401 **18 Claims**

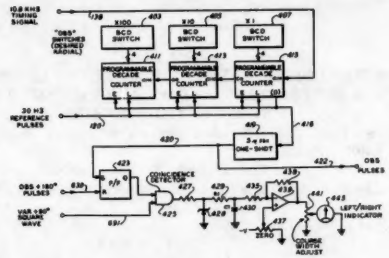
1. In a very high frequency omni-range (VOR) receiver of the type wherein an incoming VOR signal is comprised of both a reference signal and a variable signal, circuitry for producing navigation information in response to said reference and variable signals comprising:

means for generating a stream of timing pulses which are in a substantially phase-locked relationship to a stream of pulses corresponding to said reference signal;

means for producing, in response to said timing pulse stream and to said reference signal pulse stream, a stream of OBS pulses which are phase-shifted by an amount representative of a preselected radial emitted by a predetermined VOR station; and

means, operative in response to said timing pulse stream, said OBS pulse stream, and a stream of pulses corresponding to

said variable signal, for determining any phase difference existing between said OBS pulse stream and said variable



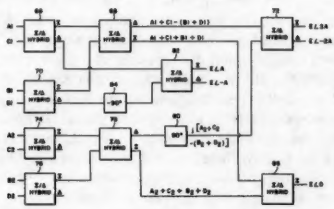
signal pulse stream and, in response thereto, producing a voltage indicative of course deviation between an actual course and said pre-selected radial.

4,604,626

ACQUISITION SYSTEM EMPLOYING CIRCULAR ARRAY

Chester E. Stromswold, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 21, 1983, Ser. No. 553,608
Int. Cl.[4] G01S 5/02
U.S. Cl. 343—417 **8 Claims**



1. A direction-finding antenna system for determining the signal direction from which signals from a signal source are received, the system comprising:

A. first and second concentric circular arrays, each array having N equally spaced antenna elements, where N is an even number greater than two, the first and second arrays being angularly offset by 180°/N;

B. a processing circuit, connected to receive the signals from each of the antenna elements of the first and second arrays, for generating an ensemble of composite n-pole signals, n=2, . . . N2, N, by:

(i) generating a first N-pole signal by adding the signals from alternate elements of the first array and subtracting the signals from the remainder of the elements of the first array;

(ii) generating a second N-pole signal by adding signals from alternate elements of the second array and subtracting the signals from the remainder of the elements of the second array;

(iii) shifting the second N-pole signal in phase by 90° and adding it to the first N-pole signal to generate a composite N-pole signal, in response to a single plane-wave signal with a wavelength substantially greater than twice the spacing between the elements, whose phase angle with respect to the phase center of the array is N/2 times the bearing angle of the plane-wave signal; and

(iv) combining signals from the antenna elements to generate, in response to a single plane-wave signal with a wavelength substantially greater than twice the spacing between the elements, composite n-pole signals, n=2, . . . , N−2, N the phase angles of the composite n-pole signals being n/2 times the bearing angle of the plane-wave signal,

whereby the ensemble of composite n-pole signals, in response to a single plane-wave signal with a wavelength substantially greater than twice the spacing between the elements, has a spatial frequency proportional to the bearing angle of the plane wave; and

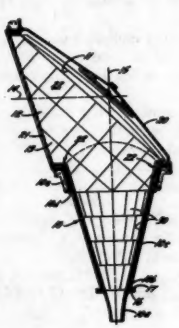
C. a spatial-Fourier-transform device, connected to receive the ensemble of composite n-pole signals and having a plurality of output terminals, for providing at its output ports a spatial Fourier transform of the ensemble of composite N-pole signals, thereby indicating the bearing angles of incoming plane waves by the positions of maxima in the spatial Fourier transform.

4,604,627

FLARED MICROWAVE FEED HORNS AND WAVEGUIDE TRANSITIONS

Saad S. Saad, Willowbrook, and Charles M. Knop, Lockport, both of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Filed Jan. 11, 1984, Ser. No. 569,789
Int. Cl.[4] H01Q 13/02
U.S. Cl. 343—786 **12 Claims**



1. A horn-reflector antenna comprising

a paraboloidal reflector for transmitting and receiving microwave energy, and

a flared feed horn for guiding microwave energy to and from said reflector, the longitudinal shape of at least a section of said horn at the end where the horn begins to flare outwardly being defined by the equation

$$R^p = R_1^p + \left(\frac{R_2^p - R_1^p}{L^p} \right) l^p$$

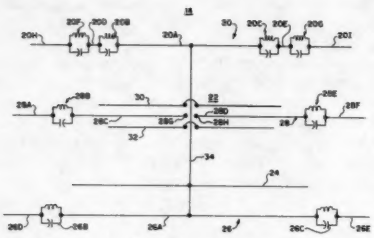
where R is the transverse dimension from the longitudinal axis of the horn to the side wall of the horn, l is the axial distance along the horn measured from said end where the horn begins to flare outwardly, R_1 and R_2 are the radii of the horn at opposite ends of the horn section defined by said equation, L is the axial length of the horn section defined by said equation, and the exponent p has a value greater than two and less than about 7, to effect a substantial reduction in the TM_{11} mode level.

4,604,628

PARASITIC ARRAY WITH DRIVEN SLEEVE ELEMENT

Roger A. Cox, Lincoln, Nebr., assignor to Telex Communications, Inc., Lincoln, Nebr.

Filed Mar. 11, 1983, Ser. No. 474,557
Int. Cl.[4] H01Q *21/12*
U.S. Cl. 343—818 **12 Claims**



2. An antenna system comprising:

a driven element adapted to be driven in a predetermined frequency band;

at least a first parasitic element;

said at least a first parasitic element having a portion self-resonant in said predetermined frequency band, positioned at betwen 0.1 and 0.3 wavelength from said driven element and tuned to form an additive field to the field of said driven element at said predetermined frequency band in a predetermined direction;

said at least a first parasitic element being parallel to said driven element;

said driven element including at least one directly fed portion and first and second sleeve portions;

said first sleeve portion having a predetermined diameter; and

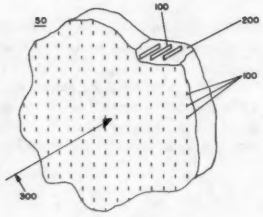
said first and second sleeve portions being spaced from each other a distance of between four and twelve times the predetermined diameter.

4,604,629

AXIAL CONDUCTANCE ANGULAR FILTER

Peter W. Hannan, Smithtown, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Apr. 23, 1984, Ser. No. 602,885
Int. Cl.[4] H01Q *15/02*
U.S. Cl. 343—909 **10 Claims**



1. An angular filter which passes a wave of electromagnetic energy at one angle of incidence to the apparatus and which attenuates waves of electro-magnetic energy at other angles of incidence, said apparatus comprising:

a. an array of a plurality of parallel, resistive elements, each of said elements having an elongated dimension, and having an axis along the elongated dimension; and

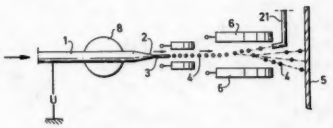
b. means for supporting said elements whereby waves of electromagnetic energy impinging on said filter in a direction substantially parallel to the axis along the elongated dimension of said resistive elements passes through said filter and a wave of electromagnetic energy impinging on said filter at an angle with respect to the axis is substantially attenuated.

4,604,630

METHOD OF APPLYING AN ELECTRICAL CHARGE IN INK JET PRINTERS, AND AN ARRANGEMENT FOR CARRYING THE METHOD

Bengt Thell, Eslöv, Sweden, assignor to Esselte Sanden AB, Eslöv, Sweden

Filed Oct. 19, 1984, Ser. No. 662,823
Claims priority, application Sweden, Oct. 24, 1983, 8305841
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **15 Claims**



1. A method for applying an electric charge in ink jet printers of the so-called continuous kind, in which electrically conductive ink or like medium is forced in the form of a jet from a container through a nozzle or like device and caused to form droplets to which an electric voltage is applied and which, by passing said droplets through deflecting electrodes, to which a voltage is applied, are caused to travel along a path determined by, inter alia, said charge, in order to produce a pre-determined transcript or the like on a printing sheet or like medium, and in which disturbances of a given kind are generated with the aid of a piezo-electric crystal **(8)**, by means of which, said jet **(3)** is disturbed in a manner to disintegrate said jet **(3)** into droplets **(4)** in a pre-determined fashion; characterized by electrically charging the ink in said nozzle **(1)** by varying the level of voltage applied with regard to the pre-determined frequency at which droplets are separated from the jet, thereby to give practically each droplet **(4)** an individual, pre-determined charge which is in relation to the level of voltage applied in conjunction with the separation of said droplets **(4)**.

4,604,631

CONTROL SYSTEM AND METHOD FOR CHARGE CONTROL INK JET PRINTER

Koichiro Jinnai, Kawasaki; Takao Fukazawa, Tokyo; Tadashi Ito, Yokohama; Takahisa Koike, Tokyo; Toshiharu Murai, Yokohama, and Kazumi Ishima, Kashiwa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 679,116
Claims priority, application Japan, Dec. 7, 1983, 58-231187
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **11 Claims**

7. In a charge control type ink jet printer for printing out one character line of data on a paper by a plurality of strokes which includes an ink jet head, a carriage loaded with charging means and deflecting means, carriage driving means for driving the carriage in a horizontal scan direction, and paper driving means for feeding the paper in a vertical scan direction, a control method comprising the steps of:

storing one character line of print data which is made of a plurality of odd and even scanning lines in a buffer memory means;

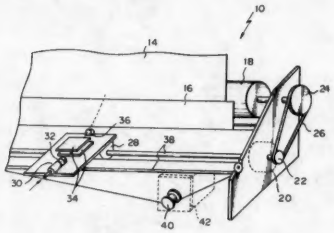
reading from said buffer memory means one of the odd scanning lines and even scanning lines, each of which contains a predetermined number of lines;

printing the line read from said buffer memory means;

feeding the paper in the vertical scan direction by an amount equal to a predetermined number of dot pitches;

reading from said buffer memory means the other of the odd scanning lines and even scanning lines;

printing said other scanning lines so as to alternate said one scanning lines and said other scanning lines;



feeding the paper in the vertical scan direction by a number of dot pitches equal to twice said predetermined number of lines minus said predetermined number of dot pitches;

whereby the head, the carriage and the carriage driving means are controlled to fully print out one character line of print data.

4,604,632

RECORDER TRANSPORT FOR PERFORATING AND CUTTING OPERATIONS

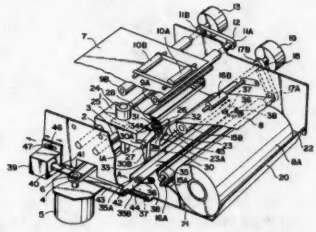
Hiroaki Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,577

Claims priority, application Japan, Aug. 16, 1982, 57-141016; Aug. 16, 1982, 57-141017; Aug. 16, 1982, 57-141018; Aug. 16, 1982, 57-141019

Int. Cl.⁴ G01D *15/28;* **H04N** *1/31;* **B41J** *3/04;* **B41F** *1/08*

U.S. Cl. 346—24 **5 Claims**



1. A recording apparatus for recording an image on a recording sheet comprising:

means for transporting the recording sheet along a path;

means located along a path for recording the image on the recording sheet in response to an image signal;

perforation means located along the path and having tooth edges for forming perforations in the recording sheet;

cutting means located downstream of said perforation means with respect to a direction in which said sheet is transported, for cutting said sheet; and

control means for controlling said perforation means such that perforations are formed at a desired margin between recorded images and such that in response to a decision to end processing, perforations are again formed after the last formed perforations are transported to said cutting means.

4,604,633

INK-JET RECORDING APPARATUS

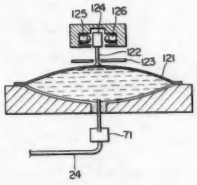
Yoshiaki Kimura, Hachioju, and Yasuhiko Tanaka, Tokyo, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd, Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,496

Claims priority, application Japan, Dec. 8, 1982, 57-216031; Dec. 8, 1982, 57-216032; Dec. 23, 1982, 57-230841; Dec. 23, 1982, 57-230842; Dec. 23, 1982, 57-230843; Dec. 23, 1982, 57-230844; Dec. 23, 1982, 57-230845

Int. Cl.⁴ G01D *18/00*

U.S. Cl. 346—140 R **9 Claims**



1. An ink jet recording apparatus comprising:

at least one ink-droplet jetting nozzle having an orifice of defined aperture;

a pressure chamber communicating with said at least one nozzle and having a flexible wall;

an ink supply system for supplying ink from an ink reservoir to said pressure chamber of said at least one nozzle;

said ink supply system comprising an ink chamber having a flexible diaphragm forming a wall thereof and which is deformable responsive to at least one of the ink pressure in said ink chamber and the amount of ink remaining in said ink chamber;

said flexible diaphragm being deformable such that a displacement thereof responsive to an ink-pressure variation of -5 to -10 cm H_2O is from 5 μm/cm H_2O to 20 mm/cm H_2O;

a light shielding means coupled to said flexible diaphragm so as to be movable responsive to deformation of said flexible diaphragm; and

light detecting means including a light emitting element and a light receiving element for receiving light emitted by said light emitting element, a light path being provided between said light emitting element and said light receiving element, said light detecting means being arranged adjacent said light shielding means;

said light shielding means being selectively movable into and out of said light path to selectively block light emitted from said light emitting element from being received by said light receiving element as a function of the deformation of said flexible diaphragm.

4,604,634

APPARATUS FOR RECORDING AND REPRODUCING AN ELECTROGRAPHIC IMAGE

Ingmar Feigt, Langensendelbach; Ernst Feldtkeller, Munich, and Gottfried Lange, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 592,313, Mar. 22, 1984, abandoned. This application Feb. 26, 1986, Ser. No. 833,671

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313764

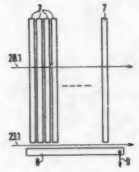
Int. Cl.⁴ G01D *15/14*

U.S. Cl. 346—160 **1 Claim**

1. Apparatus for recording and reproducing an electroradiographic image comprising, in combination:

(a) a photoconductive layer for storing an electrostatic radiation image;

(b) a plurality of adjacent strip electrodes disposed substantially in parallel on the surface of said layer;
(c) at least one discharge electrode disposed on said surface and spaced apart from said strip electrodes by a gap, said gap being bridged by photoconductive material;
(d) first means for scanning said surface with a first radiation beam, thereby to convert an electrostatic stored image into electrical signals in said discharge electrodes, said scanning means moving said radiation beam across said



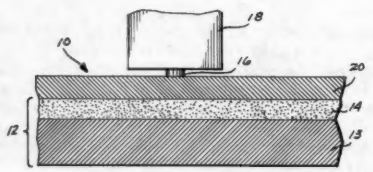
surface in a linear path whose orientation is substantially transverse with respect to the longitudinal orientation of said strip electrodes; and
(e) means for irradiating said photoconductive material in said gap between said discharge electrode and successive ones of said strip electrodes along a path substantially parallel to the orientation of the linear path, thereby to electrically connect said discharge electrode to respective ones of said strip electrodes in synchronism with the scanning of said first means.

4,604,635

THERMAL PAPER AND METHOD FOR MAKING THERMAL PAPER WITH SILICONE RESIN PROTECTIVE LAYER

Christopher A. Wiklof, Mukilteo; Gerald R. Apperson, Seattle; Robert J. Brooks, Woodinville, and Robert A. Samuel, Snohomish, all of Wash., assignors to Intermec Corporation, Lynnwood, Wash.

Filed Nov. 8, 1984, Ser. No. 669,594
Int. Cl.[4] D03D *3/00*
U.S. Cl. 346—226 **5 Claims**



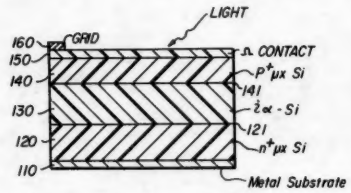
1. A thermal recording paper comprising a substrate that includes a support layer and a thermal layer comprising a heat-sensitive, image forming material, and a protective layer comprising a cured silicone resin overlying one side of the substrate, the protective layer being positioned on the same side of the support layer as the thermal layer.

4,604,636

MICROCRYSTALLINE SEMICONDUCTOR METHOD AND DEVICES

Vikram L. Dalal, Lawrenceville, N.J., assignor to Chronar Corp., Princeton, N.J.

Filed May 11, 1983, Ser. No. 493,701
Int. Cl.[4] H01L *45/00*
U.S. Cl. 357—2 **7 Claims**



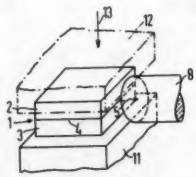
1. A semiconductor device comprising a body of amorphous semiconductor sandwiched between two doped microcrystalline semiconductor layers of opposite types of conductivity.

4,604,637

LIGHT-EMITTING DIODE SUITABLE AS A PRESSURE SENSOR

Wolfgang Rühle, Erlangen, and Claus Weyrich, Gauting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,953
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210086
Int. Cl.[4] H01L *33/00, 29/84*
U.S. Cl. 357—17 **11 Claims**



1. A luminescent diode including electrodes for supporting a constant current flow and responsive to pressure with pressure-dependent brightness of emitted luminescent radiation, said diode comprising:
a semiconductor body of III-V mixed semiconductor material consisting of $GA_{1-x}Al_xAs$ and dopants, wherein $0<x<0.4$, and including
a first component of said body comprising p-conductive material, and
a second component of said body comprising n-conductive material and forming a pn junction with said first component to define an active zone for emitting luminescent radiation,
the value of mixture of said semiconductor material being selected as an energy gap material close to the transition from a direct energy gap to an indirect energy gap and at which a change of the value x of the composition would result in a significant change in the brightness of emission so that exertion of pressure on said diode results in a pressure induced transition.

4,604,638
FIVE LAYER SEMICONDUCTOR DEVICE WITH SEPARATE INSULATED TURN-ON AND TURN-OFF GATES

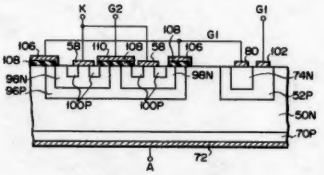
Hideo Matsuda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 16, 1984, Ser. No. 610,780

Claims priority, application Japan, May 17, 1983, 58-86062; Sep. 2, 1983, 58-161452

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **10 Claims**



1. A semiconductor device comprising:

a first layer of p-type conductivity;

a second layer of n-type conductivity contacting said first layer;

a third layer of p-type conductivity contacting said second layer;

a fourth layer of n-type conductivity contacting said third layer;

a fifth layer of p-type conductivity contacting said fourth layer;

an anode electrode formed on said first layer;

a cathode electrode formed on said fourth and fifth layers;

a first gate electrode insulatively formed over said third layer, forming a first field-effect transistor in cooperation with said second, third and fourth layers and forming a first current channel in the surface of said third layer interposed between said second and fourth layers upon receipt of a turn-on signal, flow of current in said first current channel removing the electrical barrier between said second and third layers and permitting current flow between said anode and cathode electrodes, and

a second gate electrode insulatively formed over said fourth layer, forming a second field-effect transistor in cooperation with said third, fourth and fifth layers, whereupon application of a turn-off signal to said second electrode forms a second current channel in the surface of said fourth layer interposed between said third and fifth layers, reestablishing the electrical barrier betwen said second and third layers and blocking said current flow between said anode and cathode electrodes.

4,604,639
SEMICONDUCTOR MEMORY DEVICE

Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

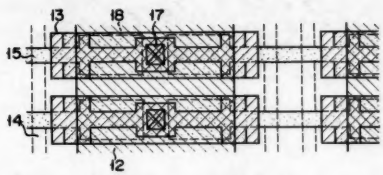
Continuation of Ser. No. 224,013, Jan. 12, 1981, abandoned. This application Dec. 23, 1983, Ser. No. 564,370

Claims priority, application Japan, Jan. 14, 1980, 55-2871

Int. Cl.⁴ H01L *29/93*

U.S. Cl. 357—23.6 **8 Claims**

1. In a semiconductor device having a plurality of memory cells each coupled to a data line and having a word line, each memory cell being formed on a semiconductor substrate of a first conductivity type, said data line being formed of a semiconductor impurity region of a second conductivity type opposite to said first conductivity type formed in said semiconductor substrate, and each memory cell including a charge storage portion formed in said semiconductor substrate and a gate portion for forming a channel in said semiconductor substrate between said semiconductor impurity region and said charge storage portion, said word line being a metal conductive layer formed on said semiconductor substrate to overlie said charge storage portion and connected to said gate portion at a junction, said word line and said data line crossing each other with an insulating layer therebetween, the improvement



wherein said word line has a first portion overlying said charge storage portion and a second portion overlying said data line, said first portion of said word line being of a width such that it completely overlies said charge storage portion, in width of said first portion being greater than the width of said second portion.

4,604,640
DARLINGTON TRANSISTORS

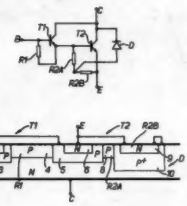
Derek Colman, Bromham, and David R. Cotton, Putnoe, both of England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 1, 1984, Ser. No. 656,216

Claims priority, application United Kingdom, Oct. 3, 1983, 8326451

Int. Cl.⁴ H01L *27/02, 27/04;* H03K *3/26*

U.S. Cl. 357—46 **6 Claims**



1. A darlington transistor having an output transistor element and at least one driver transistor element in which the output transistor element has an integrated resistor connected from base to emitter, wherein at least part of the integrated resistor is formed by a resistive region of the same conductivity type as the emitter of the output transistor element.

4,604,641
SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

Satoshi Konishi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 29, 1982, Ser. No. 445,247

Claims priority, application Japan, Nov. 30, 1981, 56-192228

Int. Cl.⁴ H01L *23/48, 23/54*

U.S. Cl. 357—59 **10 Claims**

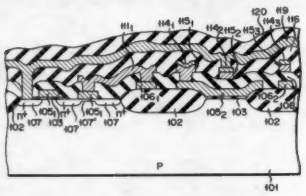
1. A semiconductor device comprising:

a semiconductor substrate having an active region including a buried contact and a field region with a field insulation layer;

a first polysilicon layer formed on said semiconductor sub-

strate and electrically connected to said active region through said buried contact;

an isolation film formed on a portion of said first polysilicon region in contact with said buired contact; and



a second polysilicon layer formed on said first polysilicon layer and said isolation film, a portion of said second polysilicon layer being located above said field insulation layer, being doped with a metal and in electrical contact with said first polysilicon layer.

4,604,642

FE-NI-CU LEADFRAME

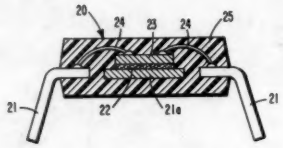
Toshiharu Sakurai, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

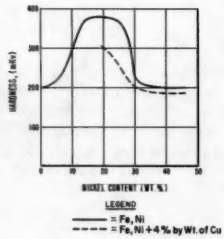
Filed Mar. 26, 1984, Ser. No. 593,515

Claims priority, application Japan, Mar. 28, 1983, 58-51984

Int. Cl.[4] H01L *29/54, 23/28, 23/50*

U.S. Cl. 357—70 **4 Claims**





1. In a semiconductor device comprising a semiconductor element:

a pair of in-line lead electrodes having a mounting island supporting the semiconductor element;

a molding resin body substantially enclosing said semiconductor element and said electrodes, wherein said electrodes and island are made from an alloy essentially consisting of 3 wt percent to 8 wt percent of copper (Cu), 25 wt percent to 30 wt percent of nickel (Ni) and the remaining amount of iron (Fe), said electrodes having a thermal expansion coefficient in the range of about 7×10^{-6} 1/°C. to about 14×10^{-6} 1/°C.

4,604,643

SEMICONDUCTOR RECTIFIER DEVICE

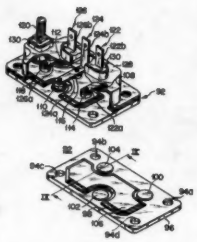
Yoshiharu Yotsumoto, Tokyo; Katsuhiko Kubota, Yokohama, and Toshinobu Sekiba, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 298,741, Sep. 2, 1981. This application Oct. 30, 1984, Ser. No. 665,509

Claims priority, application Japan, Sep. 4, 1980, 55-122660

Int. Cl.[4] H01L *23/48, 25/02, 27/02*

U.S. Cl. 357—75 **12 Claims**



1. A semiconductor rectifier device comprising:

a substrate designed to radiate heat;

a flame-sprayed ceramic layer formed directly on a surface of said substrate, and having a low heat resistance;

two first flame-sprayed metal layers formed directly on said surface of said substrate, one of the two metal layers being located at one side of said ceramic layer and the other of the two metal layers being located at the other side of said ceramic layer;

a second flame-sprayed metal layer formed on said flame-sprayed ceramic layer;

a rectifier circuit comprising first through fourth rectifying elements grouped into two pairs, each of said pairs being electrically coupled, respectively, between a separate one of said two first flame-sprayed metal layers and said second flame-sprayed metal layer, each of said rectifying elements having two terminals to permit coupling of the rectifying elements in circuit, wherein the terminals of the rectifying elements in each pair which are coupled to said first and second flame-sprayed metal layers are of opposite polarity; and

an electrode member connected to each pair of rectifying elements at the terminals which are not coupled to said first and second flame-sprayed layers.

4,604,644

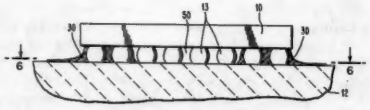
SOLDER INTERCONNECTION STRUCTURE FOR JOINING SEMICONDUCTOR DEVICES TO SUBSTRATES THAT HAVE IMPROVED FATIGUE LIFE, AND PROCESS FOR MAKING

Keith F. Beckham, Newburgh; Anne E. Kolman, Wappingers Falls; Kathleen M. McGuire, Fishkill; Karl J. Puttlitz, Wappingers Falls, and Horatio Quinones, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,597

Int. Cl.[4] H01L *23/50, 21/58;* **H05K** *7/06, 3/34*

U.S. Cl. 357—80 **15 Claims**



1. An improved solder interconnection for forming I/O

connections between an integrated semiconductor device and a support substrate comprising

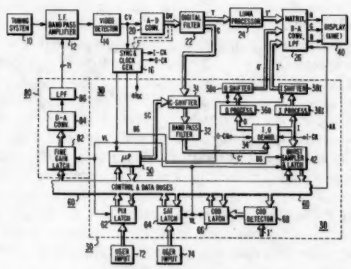
a plurality of solder connections arranged in an area array joining a set of I/O's on a flat surface of said semiconductor device to a corresponding set of solder wettable pads on a substrate,

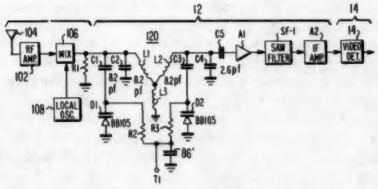
a band of dielectric organic material disposed between and bonded to said device and substrate embedding at least an outer row of solder connections, and leaving the central inner solder connections and the central underside device surface and opposing substrate surface and also the top surface of the device being free of said dielectric organic material.

4,604,645
COARSE/FINE AUTOMATIC CHROMINANCE GAIN CONTROL USING A GAIN ADJUSTABLE IF AMPLIFIER IN A DIGITAL TELEVISION RECEIVER

Henry G. Lewis, Jr., Trenton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1983, Ser. No. 537,814
Int. Cl.⁴ H04N *9/64, 9/77, 5/52*
U.S. Cl. 358—27 **20 Claims**





1. A chrominance signal processing apparatus for providing a given chrominance gain in a television receiver comprising:

analog filtering means for providing a frequency response characteristic including the frequency of a chrominance component of an analog composite video signal therein, wherein said frequency response characteristic is controllable in response to a first gain control signal for adjusting the amplitude of said chrominance component in first predetermined increments relative to other components of said analog composite video signal;

analog-to-digital converting means coupled to said analog filtering means for developing digital video samples corresponding to said analog composite video signals;

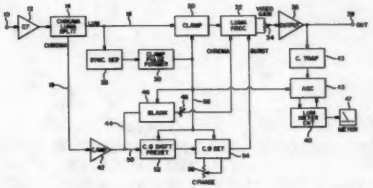
digital shifting means, coupled to said analog-to-digital converting means and responsive to a second gain control signal, for modifying the magnitude of the chrominance component of said digital video samples in second predetermined increments being greater than said first predetermined increments;

control means, coupled to said digital shifting means and to said analog filtering means and responsive to the chrominance component of said digital video samples, for developing said first and second gain control signals to apportion said given chrominance gain between said analog filtering means and said digital shifting means.

4,604,646
VIDEO PROCESSING CIRCUIT

James A. Karlock, 3311 NE. 35th Ave., Portland, Oreg. 97212

Continuation of Ser. No. 575,489, Feb. 1, 1984, abandoned, which is a continuation of Ser. No. 325,755, Nov. 30, 1981, abandoned. This application Nov. 19, 1984, Ser. No. 672,860
The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.
Int. Cl.⁴ H04N *9/64*
U.S. Cl. 358—28 **27 Claims**



1. A processing circuit for processing a color video signal comprising:

an input circuit path for receiving a video input signal,

means for removing the chrominance signal portion from said video signal,

means for clamping the video signal with the chrominance signal portion removed to a predetermined back porch clamping level of said video signal,

means for separating the luminance signal portion of the clamped video signal comprising a unilaterally conducting sync separator circuit for conducting at levels below the back porch clamping level whereby synchronizing signals are coupled through said sync separator circuit and substantially eliminated from the luminance signal portion at the input of the sync separator circuit,

means for amplifying the separated luminance signal portion from the input of the sync separator circuit,

and means for selectively recombining the amplified luminance signal portion with said synchronizing signals coupled through said sync separator circuit to provide an output signal.

4,604,647
CATHODE RAY TUBE DRIVER CIRCUIT

James C. Peele, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Oct. 22, 1984, Ser. No. 663,628
Int. Cl.⁴ H04N *9/20, 9/64, 9/16, 5/68*
U.S. Cl. 358—65 **18 Claims**

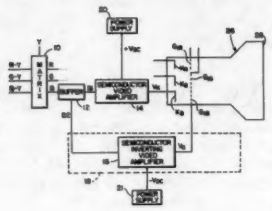
1. A circuit for driving a cathode ray tube in response to a video signal, said driving circuit comprising:

a first circuit portion responsive to said video signal for providing a first control signal to a first electrode of an electron gun, of said tube, said first control signal having a first polarity and being adapted to vary in amplitude between predetermined first limits; and

a second circuit portion responsive to said video signal for providing a second control signal to a second electrode of said electron gun, said second control signal being inverted and of opposite polarity with respect to said first control signal and being adapted to vary in amplitude between predetermined second limits;

whereby the potential difference between said first and

second electrodes varies within a predetermined range of magnitude as a function of said video signal to control the



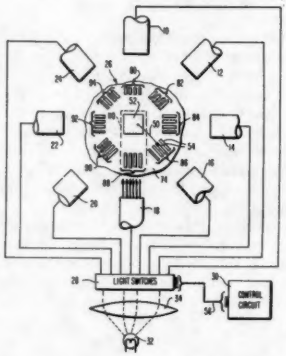
gun current and consequently the light image formed on the screen of said tube.

4,604,648

ELECTRONIC VIEWING SYSTEM FOR INTEGRATED CIRCUIT PACKAGES

Victor B. Kley, 1119 Park Hill Rd., Berkeley, Calif. 94708

Filed Oct. 12, 1984, Ser. No. 660,275
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—101 **7 Claims**



1. A system for viewing spaced metal fingers mounted in a plane on an amorphic substrate to generate electrical signals indicative of the finger pattern, comprising

utilizing means for receiving light indicative of the finger pattern,

an objective for being positioned over the finger pattern and for receiving and directing light from a field of view of the finger pattern to the utilization means,

light source means for illuminating the finger pattern with generally unidirectional light,

said light source means projecting the unidirectional light in a direction forming an acute angle relative to the plane of the metal fingers, and

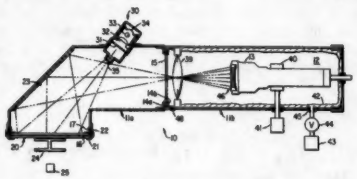
said acute angle and direction being selected so that directly reflected light from the fingers and amorphic substrate within the field of view avoids impingement upon the objective whereby scattered reflective light from the metal fingers impinges upon the objective to form an image of the metal fingers in the utilization means.

4,604,649

RADIOGRAPHIC INSPECTION MEANS AND METHOD

Sammy F. Carollo, Irving, and William E. Dance, Dallas, both of Tex., assignors to Vought Corporation, Dallas, Tex.

Filed Nov. 24, 1981, Ser. No. 324,519
Int. Cl.[4] H04N *5/32*
U.S. Cl. 358—111 **36 Claims**



1. A radiographic inspection system for producing a shadowgraoh or transmission image of an object to be inspected, comprising:

radiation means for directing radiation through the object;

a radioluminescent screen structure positioned to receive the radiation directioned through the object, the screen structure including a lithium based phosphorescent means for producing a scintillation shadowgraph pattern in response to impingement on the screen structure of the radiation directioned through the object;

a television camera for successively generating frames of video data during respective frame cycles, the camera having its optical input section directioned toward the radioluminescent screen, and having a semi-conductor target means for forming charge patterns corresponding to the scintillation patterns produced on the phosphorescent screen for producing shadowgraph images of the object, the television camera further including raster scanning means for scanning the semi-conductor target during respective frame cycles to generate an output signal corresponding to the charge pattern formed on the semi-conductor target;

means for controlling the raster scanning means for preventing scanning of the target during a blanking period extending continuously during a plurality of successive frame cycles to thereby accumulate an enhanced level of charge on the target derived from the scintillations on the phosphorescent screen, the accumulated charge representing a pattern corresponding to a shadowgraph image of the object, the control means being further operative for permitting scanning of the target, susequent to the blanking period for reading the charge accumulated during the blanking period; and

means for processing information read from sequential raster scans of the target, subsequent to respective blanking periods, and for producing a television display corresponding to the shadowgraph scintillation pattern.

4,604,650

THREE LINE VIDEO SCRAMBLING METHOD

Robert J. DelCoco, Severn, Md.; Gerald M. Borsuk, Washington, D.C., and Donald R. Lampe, Ellicott City, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 17, 1983, Ser. No. 495,549
Int. Cl.[4] H04N *7/167;* **H04L** *9/00*
U.S. Cl. 358—119 **3 Claims**

1. Apparatus for scrambling the video portion of a TV signal, comprising:

(1) a first serial first in first out memory for storing data corresponding to a full line of the video portion of said TV signal;

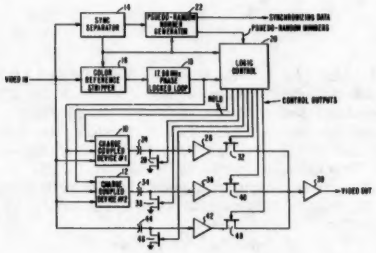
(2) a second first in first out serial memory for storing data corresponding to a full line of the video portion of said TV signal;

(3) control means for sequentially

(a) reading data representing first and second selected segments of said video portion of said TV signal stored in said first memory to form a line of scrambled video and storing data representing the video portion of a selected line of said TV signal in said first memory;

(b) reading data representing third and fourth selected segment of said video portion of said TV signal stored in said second memory to form a line of scrambled video and storing data in said second memory representing the video portion of a second selected line of said TV signal;

(c) reading data representing a fifth selected segment of



said video portion of said TV signal stored in said first memory and storing data in said first memory representing a seventh segment of the video of a third selected line of said TV signal;

(d) reading data representing a sixth segment of said video portion of said TV signal stored in said second memory and storing in said second memory data representing an eighth segment of the video signal of the third selected line of said TV signal;

(e) forming a scrambled video signal comprising said data read from said first and second memories during steps (a) through (d), and

(4) cyclically repeating steps (a) through (e) for a time interval equal to the duration of the TV signal to be scrambled.

4,604,651

TELEVISION CIRCUIT ARRANGEMENT FOR FIELD AND LINE FREQUENCY DOUBLING AND PICTURE PART MAGNIFICATION

Peter H. Frencken; Johannes G. Raven, and Marcellinus J. J. C. Annegarn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

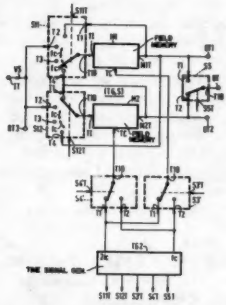
Filed Nov. 17, 1983, Ser. No. 552,656

Claims priority, application Netherlands, Dec. 7, 1982, 8204728

Int. Cl.[4] H04N *3/22, 7/01*

U.S. Cl. 358—140 **11 Claims**

1. A television circuit arrangement for field and line frequency doubling and picture part magnification, said television circuit arrangement comprising a signal input for receiving information and a signal output for supplying information; first and second field memories arranged in parallel between said signal input and said signal output, each field memory having a signal input, a signal output and a clock signal input; a write/-read circuit having first means for coupling the signal input of said television circuit arrangement to the signal inputs of said first and second field memories, respectively, second means for coupling the signal outputs of said first and second field memories, respectively, to the signal output of said television circuit arrangement, and a clock signal source circuit coupled to said first and second coupling means and said clock signal inputs of said first and second field memories, respectively, said write/-read circuit controlling writing of said information into said first and second field memories, respectively, during alternate field periods, each field period including line periods, for a writing time equivalent to a field period at a given writing speed, and reading of said information twice from said first and second field memories, respectively, during a field period following the field period in which said first and second field memories, respectively, are written, for a reading time equivalent to a field period at a reading speed which is substantially twice the writing speed; and a magnification control circuit, coupled to said first and second field memories and said write/-



read circuit, for providing said picture part magnification, characterized in that said magnification control circuit comprises a clock signal change-over circuit coupled to said clock signal source for selectively modifying the clock signals therefrom, whereby, during the writing of said information into said first and second field memories, the writing speed is selectively made higher than said given writing speed during a part of the field periods and of the line period in said writing time, which part is substantially inversely proportional to the ratio between said higher writing speed and said given writing speed.

4,604,652

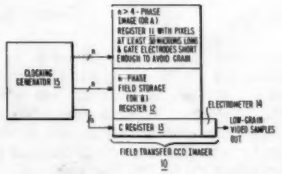
CCD IMAGERS WITH PIXELS AT LEAST THIRTY MICRONS LONG IN THE DIRECTION OF CHARGE TRANSFER

Hammam Elabd, Mercer County; Walter F. Kosonocky, Somerset County, both of N.J., and Donald F. Battson, Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 24, 1984, Ser. No. 685,725

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213 **10 Claims**



1. A method for operating a CCD imager with pixels of a dimension L at least thirty microns long in the direction of charge transfer without incurring unacceptable grain in video output signal samples therefrom, said method comprising the steps of:

using gate electrodes in said image register having equal lengths, each shorter than the length at which grain is no longer kept satisfactorily low;

during pixel transfer times, applying dynamic clocking signal to the gate electrodes crossing each CCD charge transfer channel in said image register in a number n of successive-in-time phases, n being greater than four and of

such value as to equal L when multiplied by a positive integer times the length of gate electrodes in said image register;

during image integration times between said pixel transfer times in each CCD charge transfer channel, applying static clocking signal to the gate electrodes crossing each CCD charge transfer channel in said image register in said n phases, with no two phases of said static clocking signal applied to adjacent ones of the gate electrodes in said image register simultaneously having voltages such as to induce potential energy barriers in the charge transfer channels therebeneath, and with at least two phases of said static clocking signal having voltages such as to induce potential energy wells in charge transfer channels beneath the gate electrodes in said image register to which those phases of static clocking signal are applied;

arranging to illuminate said image register with a radiant energy image during said image integration times; and

accumulating photoresponse to elements of said radiant energy image in said potential energy wells induced in the charge transfer channels.

4,604,653
DOCUMENT FILING SYSTEM

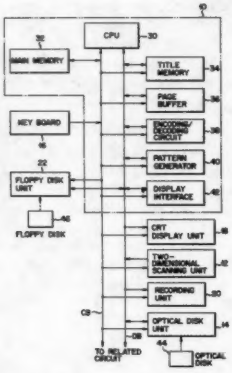
Makoto Shimizu, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 20, 1983, Ser. No. 543,964

Claims priority, application Japan, Oct. 21, 1982, 57-185126; Oct. 27, 1982, 57-188623

Int. Cl.[4] H04N *1/00, 1/32, 1/40*

U.S. Cl. 358—256 **21 Claims**



1. A document filing system comprising:

input means for selectively inputting a plurality of items of image information, retrieval data and title data, and for selectively inputting a code corresponding to the title data corresponding to desired image information;

first storing means for storing a plurality of items of image information input by the input means at a corresponding plurality of addresses;

processing means including: first read/write means for selectively writing the items of image information in, and for selectively reading the items of image information from, the first storing means; and addressing means for applying to said first read/write means an address of said first storing means corresponding to a code input by said inputting means in order to read out desired image information from said first storing means;

second storing means including a retrieval data area for storing retrieval data of each item of image information inputted by the input means and a title data area for storing title data corresponding to each of plural item groups of image information into which image items are classified and which represent respective titles;

second read/write means for selectively writing retrieval data in, and selectively reading the retrieval data from, the retrieval data area of the second storing means and for writing title data in and reading the title data from the title data area of the second storing means;

means for retrieving the image information in accordance with the retrieval data input by said input means; and

output means for outputting the title data of each item group in the form of a soft copy or a hard copy, said output means obtaining said title data from the title data area of said second storing means to select the title data corresponding to desired image information from displayed or printed title data.

4,604,654
IMAGE FORMING METHOD AND APPARATUS

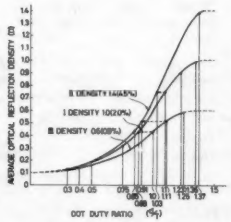
Nobuaki Sakurada, Yokohama; Yoshitaka Watanabe; Hideaki Kawamura, both of Tokyo, and Yuichi Sato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 514,592, Jul. 18, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 758,851

Claims priority, application Japan, Jul. 23, 1982, 57-128541; Jul. 23, 1982, 57-128542; Jul. 23, 1982, 57-128543; Jul. 23, 1982, 57-128553

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—298 **7 Claims**



1. An image forming method for forming on a medium an image pattern comprising a plurality of picture elements with different light-reflecting properties providing different optical reflection densities by using pattern elementary marks on the medium at a substantially constant pitch to form the picture elements, the method comprising the steps of:

determining within which of a first optical reflection density range and a second optical reflection density range the optical reflection density of an area of the image pattern falls, the first range having an upper limit higher than the lower limit of the second range;

providing a pattern elementary mark with a first density when the optical reflection density of an area of the image pattern to be depicted thereby is in the first optical reflection density range, the pattern elementary mark having a size that provides the image area depicted thereby an optical reflection density substantially the same as the determined optical reflection density;

providing a pattern elementary mark with a second density higher than the first density when the optical reflection density of an area of the image pattern to be depicted thereby is in the second optical reflection density range, the pattern elementary mark having a size that provides the image area depicted thereby with an optical reflection density substantially the same as the determined optical reflection density; and

setting the optical reflection density ranges so that efficient representation of the optical reflection densitites of the image pattern throughout the image can be performed by

the pattern elementary marks having the first and second densities.

4,604,655

METHOD OF RECORDING AND REPRODUCING VIDEO FORMAT SIGNAL

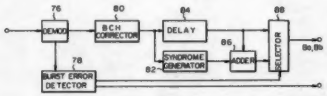
Yoshiaki Moriyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,245

Claims priority, application Japan, Oct. 23, 1982, 57-186568; Oct. 23, 1982, 57-186569

Int. Cl.[4] H04N *5/91*

U.S. Cl. 358—343 **29 Claims**



1. A method of recording and reproducing a video format signal containing picture information, sound information and control information comprising:

forming said control information as data indicative of identification numbers of sections of a two-dimensional picture format into which said sound information is to be inserted,

recording said sound information and said control information on said recording medium in the form of binary signals each comprising a predetermined number of bits of data,

modulating each of said binary signals before recordation on said recording medium such that the signal level is inverted between every adjacent two bits,

reproducing the video format signal on said recording medium in a two-dimensional picture format which is divided into a plurality of sections having predetermined identification numbers respectively allocated thereto, said sections comprising at least one section for inserting said sound information in accordance with said control information, at least one section for inserting said control information and remaining sections for inserting said picture information,

monitoring the inversions of signal level during reproduction of said picture and sound information; and

signaling an occurrence of a burst error in response to a break in the regularity of inversions of signal level during reproduction of said picture and sound information.

4,604,656

TAPE STOP POSITION DETECTING APPARATUS AND MAGNETIC VIDEO REPRODUCING APPARATUS USING THE SAME

Toshifumi Fujii, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,958

Claims priority, application Japan, Mar. 11, 1983, 58-41250; Apr. 29, 1983, 58-76709; Oct. 20, 1983, 58-197780; Oct. 21, 1983, 58-197798

Int. Cl.[4] G11B *5/00;* **H04N** *5/782*

U.S. Cl. 360—10.1 **21 Claims**

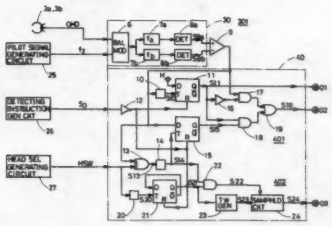
1. A tape stop position detecting apparatus for a magnetic video reproducing apparatus in which first to fourth pilot signals of different frequencies recorded in first to fourth video tracks, respectively, in a magnetic tape cyclically together with a video signal are reproduced from said magnetic tape, comprising:

a plurality of rotational magnetic heads for reproducing said signals from said magnetic tape to provide a reproduced signal,

comparing means connected to said rotational magnetic heads for comparing the amounts of predetermined two pilot signals out of said first to fourth pilot signals contained in said reproduced signal to provide a comparison output,

head selecting signal generating means for generating a head selecting signal for selection of said rotational magnetic heads,

region signal generating means connected to said comparing means for generating, in response to said comparison output, a region signal indicating in which region among the first to fourth regions associated with said first to fourth video tracks the stop position of said magnetic tape is located, said stop position of said magnetic tape being the reproducing position on said magnetic tape when said magnetic tape is at a stop, and



position signal generating means connected to said comparing means and said head selecting signal generating means for generating position signal indicating the stop position of said magnetic tape in response to said comparison output and said head selecting signal in case where the stop position of said magnetic tape is located in predetermined two regions out of said first to fourth regions.

4,604,657

APPARATUS FOR PROCESSING PCM SIGNAL

Tadashi Fukami, Yokohama, and Kentaro Odaka, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

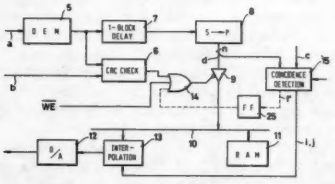
PCT No. PCT/JP84/00025, § 371 Date Oct. 1, 1984, § 102(e) Date Jan. 1, 1984, PCT Pub. No. WO84/02999, PCT Pub. Date Aug. 2, 1984

PCT Filed Jan. 31, 1984, Ser. No. 662,410

Claims priority, application Japan, Jan. 31, 1983, 58-14335

Int. Cl.[4] G11B *5/00, 5/09, 27/02;* **H04J** *3/06*

U.S. Cl. 360—32 **9 Claims**

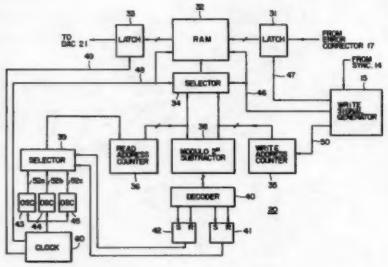


1. An apparatus for processing a PCM data signal, wherein one-segment of data consists of a plurality of blocks, and each block consists of a plurality of PCM data and a segment address that is the same for each block in a given segment, characterized in that said apparatus comprises a coincidence detection circuit receiving said PCM data signal for detecting a coincidence/non-coincidence of the segment address between every two adjacent blocks of a given segment and producing a non-coincidence signal when said segment addresses do not coincide, and compensating means for performing data compensation in response to said non-coincidence signal from said detection circuit.

4,604,658
MEMORY CONTROL CIRCUIT FOR REMOVING JITTER

Chitoshi Hibino, and Harukuni Kobari, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Continuation of Ser. No. 311,026, Oct. 13, 1981, abandoned.
This application Oct. 19, 1984, Ser. No. 662,535
Int. Cl.[4] H04N *5/78*
U.S. Cl. 360—36.2 6 Claims



1. An apparatus for controlling write-in and readout operations of a memory responsive to digital data input signals subject to jitter, the apparatus controlling the memory so that digital output signals read out of the memory and including the data do not include the jitter, comprising:

write-in address means connected to be responsive to said digital data input signals for generating a write address count that changes at a rate substantially equal to the occurrence rate of said digital input signals and for writing each digital input signal into said memory at an address indicated by said write address count;

read-out rate control means for deriving an output signal

read-out address means connected to be responsive to the output signal of the read-out rate control means, the read-out address means being operable at a controlled rate in response to said output signal for generating a read address count that changes at a rate whereby the read address count is time interleaved with the times at which said write address count is generated and for reading each digital signal from said memory in response to said read address count;

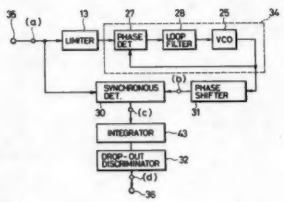
address monitor means responsive to said changing write and read address counts for detecting the number of digital signals stored in said memory, the address monitor means having first, second and third values respectively corresponding to the memory being at: an upper allowable limit for the number of digital signals stored in said memory, a lower allowable limit for the number of digital signals stored in said memory, and for the number of digital signals of said memory being between the upper and lower allowable limits; and

rate control means including: a first source for generating a standard frequency signal, a second source for generating a signal having a higher frequency than the standard frequency and a third source for generating a signal having a lower frequency than the standard frequency, and means responsive to the first, second and third sources and said address monitor means for coupling: (a) said first source to said read-out address means when said detected number is between said first and second values to cause the read-out address means to operate at a standard rate, (b) said second source to said read-out address means in response to said first value being reached to increase the operating rate of said read-out address means, and (c) said third source to said read-out address means in response to said second value being reached to decrease the operating rate of said read-out address means.

4,604,659
APPARATUS FOR DETECTING A DROP-OUT IN A MAGNETIC RECORDING/REPRODUCING APPARATUS

Shigeyuki Itoh, Ibaraki; Yoshizumi Watatani, and Katsuo Mohri, both of Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,520
Claims priority, application Japan, Oct. 19, 1983, 58-194297
Int. Cl.[4] G11B *20/06;* H04N *5/78*
U.S. Cl. 360—38.1 25 Claims



1. An apparatus for detecting a drop-out condition in a magnetic recording/reproducing apparatus wherein an FM audio signal is recorded on a magnetic tape and is reproduced therefrom utilizing a rotary magnetic head, the apparatus comprising:

frequency demodulator means including a phase locked loop frequency demodulator for demodulating a reproduced FM signal and for providing an output signal indicative thereof;

synchronous detector means for synchronously detecting the reproduced FM audio signal with the output signal of the phase locked loop frequency demodulator and for providing an output signal indicative thereof;

integrator means for integrating an output signal of the synchronous detector means and providing an integrated output signal therefrom; and

drop-out discriminator means responsive to the integrated output signal for detecting a drop-out and for providing an output signal indicative thereof.

4,604,660
METHOD AND CIRCUIT FOR CORRECTING A RECORD TIMING

Tuneo Horie, Odawara; Shiyozi Ozaki, Kanagawa, and Takikazu Takeuti, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

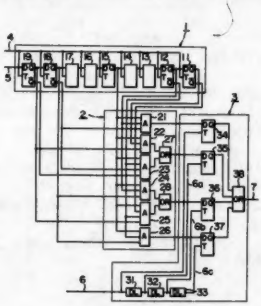
Filed Oct. 14, 1983, Ser. No. 542,180
Claims priority, application Japan, Oct. 27, 1982, 57-187417
Int. Cl.[4] G11B *5/09;* H04B *1/10, 14/04*
U.S. Cl. 360—45 13 Claims

1. A record timing correction method in a magnetic recording apparatus for writing on a record medium digital data consisting of a plurality of bits translated to include i to i+k "0" bits between adjacent "1" bits, comprising the steps of:

detecting the state of a bit at a specified position in the digital data serially recorded on said record medium and the state of the i-th bit from said specified position;

designating a normal timing in the data recording when the state of the bit at said specified position is "1" and the number "if" of "0" bits between the "1" bit at said specified position and a preceding "1" bit is equal to i+k and the number "ir" of "0" bits between the "1" bit at said specified position and a next "1" bit is equal to i+k, designating an early timing in the data recording when the number "if"=i and the number "ir">i, and designating a late timing in the data recording when the number "if"≧i and the number "ir"=i or when the number "if"≧i+1 and the number "ir"=i+1; and

correcting the record timing to provide said normal timing, said early timing or said late timing, whereby the output



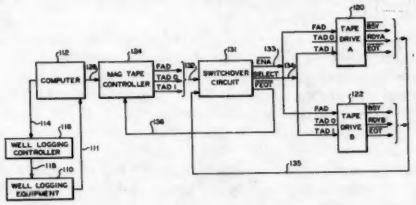
data is produced at said normal timing, said early timing or said late timing depending on the bit pattern designation.

4,604,661

AUTOMATIC SWITCHING APPARATUS AND METHOD

Wallace E. DeShon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 5, 1984, Ser. No. 668,066
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—69 23 Claims



1. An apparatus comprising:

a mode setting means for selectively generating an automatic mode signal representative of an automatic mode, or a non-automatic mode signal representative of a non-automatic mode;

a switching means for receiving either mode signal so as to be set in a respective mode, said switching means having the capability of generating a number of different possible selection signals, only one selection signal being generated at any one time, wherein in the automatic mode, said switching means automatically switches from generating one selection signal to another selection signal in response to receival of a predetermined input which includes a control pulse, and wherein in the non-automatic mode, one selection signal does not switch to another selection signal in response to said predetermined input; and

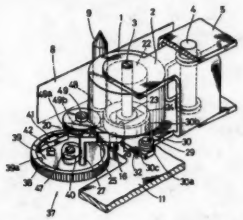
a signal capturing means for receiving said first control pulse and for generating, in the non-automatic mode, a pseudo-control signal which changes in a predetermined manner in response to said control pulse so as to simulate said control pulse, said signal capturing means being unresponsive to said control pulse when said switching means is set in the automatic mode.

4,604,662

AUTOMATIC MODE-CHANGE MECHANISM FOR TAPE RECORDER

Mitsuru Ida, Saitama, and Minoru Shimada, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 19, 1984, Ser. No. 632,623
Claims priority, application Japan, Jul. 30, 1983, 58-140266
Int. Cl.[4] G11B *15/18, 15/28*
U.S. Cl. 360—74.1 9 Claims



1. In a cassette tape recording and/or reproducing apparatus having a motor-driven capstan which, in a selected operating mode of the apparatus, is rotated for driving the tape in the cassette in the direction for winding the tape onto a take-up reel; a device for automatically changing the operating mode of the apparatus when the tape is fully wound on the take-up reel, comprising:

a pinch roller movable between operative and inoperative positions in respect to said capstan and which is rotated when the tape is running and which stops rotating when the tape is fully wound on said take-up reel, said pinch roller having a cylindrical actuating portion rotatable coaxially therewith;

a mode-change lever having an elongated hole with converging sides in which said cylindrical actuating portion is received so that said mode-change lever is angularly displaceable about the axis of rotation of said pinch roller and also longitudinally displaceable in the direction along said elongated hole;

spring means urging said mode-change lever in one direction along said elongated hole for frictionally engaging said converging sides with said actuating portion and thereby frictionally urging said mode-change lever to turn with said pinch roller so long as the latter is rotated;

means for establishing another operating mode of the apparatus in response to displacement of said mode-change lever in the opposite direction along said elongated hole against the force of said spring means; and

mode-change drive means effecting a repeated motion in response to rotation of said capstan and being operative to displace said mode-change lever in said opposite direction only when said pinch roller stops rotating and no longer frictionally urges said mode-change lever to turn therewith angularly about said axis, whereby said mode-change lever is moved to an inoperative position in response to movement of said pinch roller to said inoperative position of the latter.

4,604,663

FLOPPY DISK DRIVER

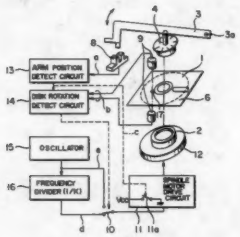
Yoshihiro Moribe, Chigasaki; Nobukuni Ohkubo, Kanagawa; Mikio Takahashi, and Kazuo Nakagoshi, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,033
Claims priority, application Japan, Mar. 5, 1984, 59-40328
Int. Cl.[4] G11B *19/26*
U.S. Cl. 360—73 11 Claims

1. A floppy disk driver for recording and reproducing data on a recording disk by holding said disk at a center hole thereof between a spindle driven with a motor and a rotatable collet so

that said disk is rotated for data recording or reproduction, said floppy disk driver comprising:

speed detection means for detecting that said recording disk held between said collet and spindle has reached a first rotational speed; and



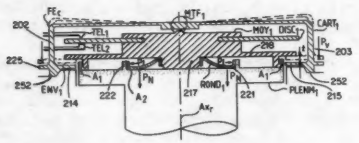
a control circuit operating on said motor to speed up from said first rotational speed to a second rotational speed in response to the detection of said first rotational speed of said floppy disk by said speed detection means, said floppy disk driver performing data recording or reproduction while said recording disk rotates at said second rotational speed.

4,604,664

MAGNETIC DISC CARTRIDGE WITH CENTERING STRUCTURE

Guy Barski, Paris, France, assignor to CII Honeywell Bull, France

Filed Feb. 1, 1983, Ser. No. 462,911
Claims priority, application France, Feb. 11, 1982, 82 02206
Int. Cl.[4] G11B *23/02*
U.S. Cl. 360—97 **22 Claims**



1. A cartridge for a removable magnetic disc designed to be inserted into a suitable receptacle of a magnetic disc memory unit, the cartridge comprising a shell inside which the disc is positioned, the shell having an aperture through which a transducing head for accessing data contained on the disc is introduced, the head being a part of the memory unit, a hub for carrying the disc, means for coupling the hub to a rotary drive mechanism of the memory unit, the rotary drive mechanism including a reference planar surface and reference cylinder concentric with a rotation axis of the rotary drive mechanism, the hub including:

a cylindrical mechanism contacting the reference planar surface for precentering the hub on the axis of rotation of the drive mechanism when the cartridge is in the receptacle, and

an elastically deformable mechanism contacting the reference planar surface and an internal wall of the reference cylinder for precisely centering the hub relative to the axis of rotation when the cartridge is in the receptacle;

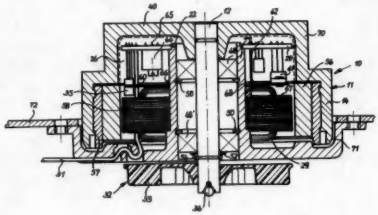
the shell including means for applying a compressive force to the hub and to the elastic mechanism, the compressive force being applied perpendicular to the plane of the disc to deform the elastic mechanism in such a way that the elastic mechanism simultaneously exerts pressures perpendicular to and against the reference planar surface and perpendicular to and against the wall of the reference cylinder.

4,604,665

DRIVING MECHANISM FOR MAGNETIC HARD DISC

Rolf Müller; Dieter Elsässer, both of St. Georgen; Johann von der Heide, Mönchweiler, and Georg Papst, St. Georgen, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, Black Forest, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 326,559, Dec. 2, 1981, Pat. No. 4,519,010. This application Nov. 10, 1982, Ser. No. 440,537
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045972; Nov. 10, 1981, 3144629; United Kingdom, Dec. 3, 1981, 8136443
Int. Cl.[4] G11B *17/00, 25/04*
U.S. Cl. 360—97 **14 Claims**



1. A driving mechanism for magnetic hard discs, comprising:

means in said mechanism isolating a space for maximum cleanness;

a driving motor mounted within said apparatus and having a stator and a rotor, said motor when energized having parts producing magnetic flux;

a rotor shaft mounting said rotor, said shaft being mounted in a bearing system;

a hub extending into the space of maximum cleanness for receiving therein at least one magnetic hard memory disc;

means between said motor and said hub for driving said hub;

means forming a magnetic flux shield and located between the parts producing the magnetic flux and the space of maximum cleanness for receiving the hard memory disc; and

means detachably connecting the rotor and at least parts of the stator to the rotor shaft independently of any connection between said shaft and said hub.

4,604,666

DATA TRANSFER APPARATUS FOR USE WITH A MAGNETIC DISK CARTRIDGE

Toshihiro Kitahara, and Yasushi Noda, both of Tokyo, Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,005
Claims priority, application Japan, Nov. 30, 1983, 58-225569
Int. Cl.[4] G11B *17/04*
U.S. Cl. 360—99 **8 Claims**

1. A data transfer apparatus for use with a disk cartridge having a magnetic disk rotatably housed in a protective envelope therefor, comprising:

(a) a base structure;

(b) a disk drive mechanism on the base structure for imparting rotation to the magnetic disk of the disk cartridge, the disk drive mechanism including a drive hub rotatable about a predetermined axis in driving engagement with the magnetic disk;

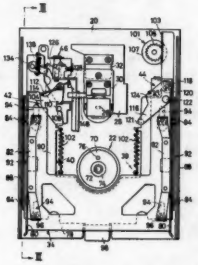
(c) a pair of magnetic transducer heads arranged substantially opposite each other, normally with a spacing therebetween, for data transfer contact with the opposite faces of the magnetic disk of the disk cartridge, at least one of the transducer heads being movable toward and away

from the other transducer head into and out of data transfer contact with the magnetic disk;

(d) a cartridge cradle mounted on the base structure for movement between a first position, where the disk cartridge is to be loaded on and unloaded from the cartridge cradle in a direction at right angles with the axis of rotation of the drive hub of the disk drive mechanism, and a second position where the drive hub of the disk drive mechanism makes driving engagement with the magnetic disk of the loaded disk cartridge;

(e) a cradle transport mechanism for moving the cartridge cradle between the first and second positions, the cradle transport mechanism including resilient means biasing the cartridge cradle from the first toward the second position;

(f) a first locking mechanism acting on the cradle transport mechanism for normally holding the cartridge cradle in the first position against the bias of the resilient means, the first locking mechanism being adapted to be tripped in



response to the loading of the disk cartridge on the cartridge cradle;

(g) a second locking mechanism acting directly on the cartridge cradle for normally holding the same in the first position, the second locking mechanism being also adapted to be tripped in response to the loading of the disk cartridge on the cartridge cradle; and

(h) a head transport mechanism for causing at least one of the transducer heads to move toward the other transducer head, and hence for establishing data transfer contact of the transducer heads with the opposite faces of the magnetic disk of the loaded disk cartridge, when the cartridge cradle travels with the disk cartridge from the first to the second position upon tripping of both the first and the second locking mechanisms;

(i) whereby the head transport mechanism holds the pair of transducer heads away from each other unless both the first and the second locking mechanisms are tripped.

4,604,667

RECORDING MEDIUM FOR RECORDING AND/OR REPRODUCING APPARATUS

Hisao Kinjo, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 25, 1982, Ser. No. 436,418

Claims priority, application Japan, Oct. 27, 1981, 56-171868; Aug. 2, 1982, 57-134930

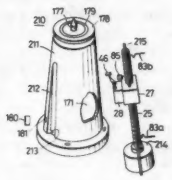
Int. Cl.[4] G11B *5/004*

U.S. Cl. 360—100 **8 Claims**

1. A recording medium which is user-replaceable for a recording and/or reproducing apparatus which comprises a rotational motor and recording and/or reproducing means, said motor including a rotary shaft, said recording medium being accommodated within an accommodating case which constitutes a cartridge together with said recording medium, said recording medium comprising:

a main body having opposite ends and including a hollow tapered part having a central axis, said tapered part being open at one of said ends of said main body, said main body having a diameter at said one open end which is greater than the diameter of said main body at the other end, said tapered part having a peripheral surface with a recording surface thereon;

magnetic coupling means on said other end of said main body for user-replaceably magnetically coupling said recording medium to the rotary shaft of said motor, said



magnetic coupling means including means for supporting said main body along an axial direction of said tapered part when said recording medium is magnetically coupled to the rotary shaft of said motor; and

preventing means for preventing the recording surface of said recording medium from making contact with an inner peripheral surface of said accommodating case, said preventing means being provided on at least one of said recording medium and said accommodating case.

4,604,668

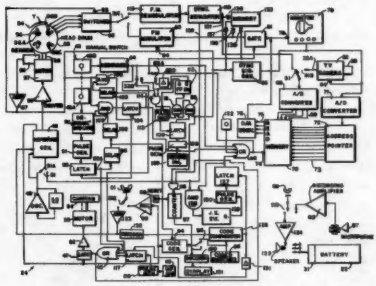
PORTABLE TELEVISION CAMERA AND RECORDING UNIT

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation of Ser. No. 209,057, Nov. 21, 1980, abandoned. This application Jul. 25, 1983, Ser. No. 516,532

Int. Cl.[4] H04N *5/782*

U.S. Cl. 360—10.1 **19 Claims**



1. A camera recording apparatus comprising:

a housing,

a television camera supported within said housing and having an input for optical image phenomena occurring exterior of said housing,

means for controlling the operation of said camera to cause said camera to scan the image field thereof and to generate a single full-frame video picture signal on its output,

receiving means for said full-frame video picture signal including:

a video recorder operable to record full-frame video picture signals on a recording means thereof, and

a video monitor supported within said housing and having a viewing screen viewable from the exterior of said housing,

buffer means supported within said housing for recording

full-frame video picture signals and having means for reproducing picture signals recorded therein and applying same to said video monitor,

means for operating said buffer means for sustaining a still image on said viewing screen of said video monitor defined by a full-frame video picture signal recorded in said buffer means,

selectively operable control means for passing selected full-frame video picture signals of still image phenomena recorded in said buffer means to said video monitor and applying same to control said monitor and to generate a still image of said scanned phenomena on the screen of said monitor, and

further control means for disconnecting said buffer means from said video monitor to permit video picture signals sequentially generated by said video camera to be applied to said video monitor to cause motion picture image phenomena to be generated on the viewing screen of said video monitor.

4,604,669

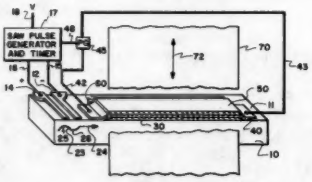
MAGNETOSTRICTIVE RECORD HEAD

Dale O. Ballinger, Lakewood; William R. Chynoweth, and Gerald J. Wade, both of Littleton, all of Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 4, 1984, Ser. No. 647,192

Int. Cl.[4] G11B *5/30*

U.S. Cl. 360—113 **11 Claims**



1. Apparatus for use in recording information on a magnetic medium movable along a path comprising:

piezoelectric means having a first substantially planar surface;

first and second electrodes on the first surface a predetermined distance apart;

a first magnetostrictive layer on the first surface;

a second magnetostrictive layer magnetically coupled to the first magnetostrictive layer; and

a conductive layer between the first and second magnetostrictive layers, the piezoelectric means, the first and second magnetostrictive layers and the conductive layer each having an edge lying in a plane which is adjacent the path.

4,604,670

MAGNETIC HEAD

Eelco G. Visser, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,273

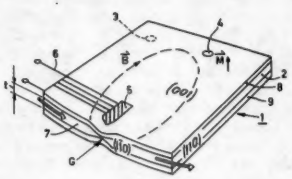
Claims priority, application Netherlands, Feb. 9, 1982, 8200481

Int. Cl.[4] G11B *5/133, 5/127, 5/187*

U.S. Cl. 360—127 **9 Claims**

1. In a magnetic head comprising

a magnetizable ferrite core for providing a substantially closed planar flux path for magnetic flux during writing or reading operations of the magnetic head, said core having a gap in said flux path and a pair of opposite faces parallel to the plane of said flux path; the improvement wherein the head is of a material having magneto-strictive properties and comprises means for producing a uniaxial magnetic anisotropy in said core having an easy axis of magnetization which is oriented in a direction transverse to said planar path for the magnetic flux, the anistropy producing means including means for applying a mechanical



stress to said faces, the mechanical stress being such that the uniaxial magnetic anisotropy is caused by the mechanical stress.

4,604,671

MAGNETIC RECORDING TAPE CASSETTE

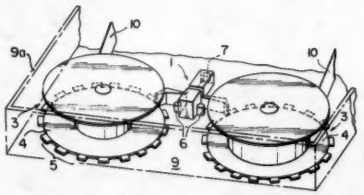
Kengo Oishi, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Odawara, Japan

Filed Jul. 26, 1983, Ser. No. 517,281

Claims priority, application Japan, Jul. 28, 1982, 57-131503

Int. Cl.[4] G11B *15/32;* **G03B** *1/04*

U.S. Cl. 360—132 **3 Claims**



1. In a magnetic recording tape cassette comprising a casing, a pair of reels which are mounted for rotation in the casing and around which a magnetic recording tape is wound, said tape including an unwound portion, said reels being rotatable in a winding direction and an unwinding direction, and a braking device for preventing rotation of said reels in said unwinding direction, said reels having a flange provided with gear teeth on a periphery thereof, the improvement wherein said braking device comprises:

a braking member having a body portion movable in a direction perpendicular to a line passing through the centers of said reels back and forth with respect to said line between an operative position remote from said line and an inoperative position near said line, said braking member being disposed on the same side as said unwound portion of said tape with respect to said line;

a pair of wing-like swinging portions integrally extending from said body portion on opposite sides thereof toward the flanges of the respective reels;

an engaging hook formed on a free end of each swinging portion to be engaged with said gear teeth of the corresponding reel, said swinging portions being resiliently urged to an engaging position in which said engaging hooks are brought into engagement with said gear teeth; and

engaging means for engaging with said swinging portions in response to movement of said body portion toward said line to the inoperative position to swing said swinging portions to a disengaging position in which said engaging hooks are released from said gear teeth overcoming the resilient force urging said swinging portions, said body

portion normally being held in the operative position by a counter force exerted thereon against the resilient force through the engagement between said engaging hooks and said gear teeth by which engagement, said reels are prevented from rotating in said unwinding direction.

4,604,672

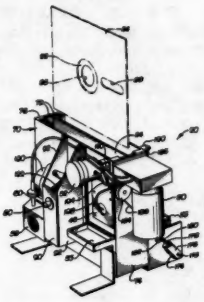
APPARATUS AND METHOD FOR ENHANCING FLEXIBLE MAGNET DISK PERFORMANCE

C. Paul Davis, Woodland Hills, and Eli Neuman, Chatsworth, both of Calif., assignors to PerfectData Corporation, Chatsworth, Calif.

Continuation-in-part of Ser. No. 257,769, Apr. 27, 1981, abandoned. This application May 31, 1983, Ser. No. 499,189

Int. Cl.⁴ G11B *23/00*

U.S. Cl. 360—137 **52 Claims**



1. A system for treating a floppy disk disposed in an envelope with conditioning fluid to clean, lubricate, and de-staticize said floppy disk comprising:

a first fluid absorbing pad;

means for moving said first fluid absorbing pad into and out of contact with a first magnetic information storing surface of said disk through a read-write opening in the envelope;

fluid dispensing means for providing conditioning fluid to said first fluid absorbing pad; and

means for rotating said floppy disk about its center, said envelope remaining stationary while said floppy disk is rotating, so that said first magnetic information storing surface is treated with conditioning fluid by means of contact of said surface with said first pad to which fluid is dispensed.

4,604,673

DISTRIBUTION TRANSFORMER WITH SURGE PROTECTION DEVICE

Charles W. Schoendube, Hickory, N.C., assignor to General Electric Company, King of Prussia, Pa.

Continuation of Ser. No. 609,661, May 14, 1984, abandoned. This application Nov. 20, 1984, Ser. No. 673,214

Int. Cl.⁴ H02H *7/04*

U.S. Cl. 361—38 **9 Claims**

1. A distribution-type single-phase transformer having a surge protection arrangement comprising;

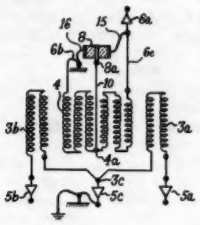
(a) a layer-type high voltage winding having two terminals, one being a high voltage terminal for connection to a high voltage line,

(b) a divided low voltage winding comprising two winding sections and a grounded interconnection between said winding sections,

(c) varistor means having opposite ends and comprising a plurality of stacked metal oxide varistor elements between said ends, said varistor means being connected from said high voltage terminal of said high voltage winding to ground,

(d) means for connecting said varistor means at not more than two points intermediate its ends to a corresponding number of points on said high voltage winding intermediate the terminals of said high voltage winding,

(e) the portions of said varistor means located between each of its opposite ends and an adjacent intermediate connection and any portion located between adjacent intermediate connections, if more than one intermediate connection



is present, being substantially equal in impulse protective level rating,

(f) the corresponding portions of said high voltage winding being substantially equal in numbers of turns, whereby protection is provided for said high voltage winding against both voltage surges entering said transformer via the terminals of said high voltage winding and current surges entering said transformer via the terminals of said low voltage winding,

(g) said transformer further comprising an oil-filled tank in which said windings and said varistor means are located.

4,604,674

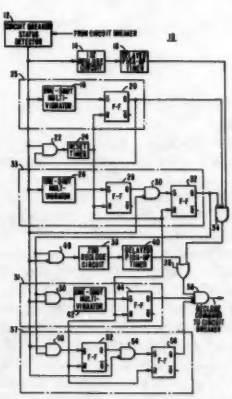
RECLOSING RELAY APPARATUS

Richard G. Hamel, Margate, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 527,887, Aug. 30, 1983, abandoned. This application Mar. 13, 1985, Ser. No. 712,315

Int. Cl.⁴ H02H *3/06, 3/07*

U.S. Cl. 361—73 **4 Claims**



1. Reclosing relay apparatus for reclosing a circuit breaker in an electrical power system when the circuit breaker trips in response to a fault in the electrical power system, said apparatus including a reclosing stage with two lockout circuits for

reliably preventing circuit breaker pumping, and detector means for determining the trip status and reclosure status of the circuit breaker and for generating a status signal representative thereof, said reclosing stage comprising:

reclosing means governed by said status signal for reclosing the circuit breaker after a first predetermined time interval measured from the initiation of a trip status of the circuit breaker as indicated by said status signal;

first lockout circuit governed by said status signal for setting a first lockout signal upon reclosure of the circuit breaker as indicated by said status signal to disable said reclosing means from reclosing the circuit breaker;

second lockout circuit governed by said status signal for setting a first lockout signal, independent of said first lockout circuit, to redundantly disable said reclosing means from reclosing the circuit breaker, said second lockout circuit comprising:

first circuit stage governed by the status signal for generating an intermediate signal upon reclosure of the circuit breaker as indicated by said status signal; and

second circuit stage governed by said intermediate signal and the status signal for setting the second lockout signal upon retrip of the circuit breaker as indicated by the combination of the status and intermediate signals; and

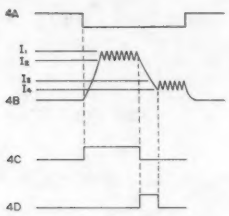
reset means for resetting said first and second lockout signals after a second predetermined time interval measured from the initiation of said reclosure status of the circuit breaker to enable said reclosing means for reclosing the circuit breaker, said second predetermined time interval being longer than said first predetermined time interval.

4,604,675

FUEL INJECTION SOLENOID DRIVER CIRCUIT

Mark R. Pflederer, Tremont, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 16, 1985, Ser. No. 755,385
Int. Cl.⁴ H01H *47/32*; F02D *1/00*
U.S. Cl. 361—155 **6 Claims**



1. A fuel injection solenoid driver circuit, comprising:

a solenoid coil;

a storage capacitor;

first switching means for controllably connecting and disconnecting a solenoid coil to and from a storage capacitor in response to receiving a control signal;

second switching means for controllably connecting and disconnecting said solenoid coil to and from system ground in response to receiving a control signal;

means for delivering a first control signal to said first and second switching means and enabling said first and second switching means for a first preselected duration of time to initiate current flow in said solenoid coil;

third means for sensing the magnitude of the current in said solenoid coil and delivering a second control signal to said first switching means to alternately connect and disconnect said solenoid coil to and from the storage capacitor in response to the magnitude of said current respectively falling below and rising above a first and second preselected level;

fourth means for sensing the magnitude of the current in said solenoid coil and delivering a third control signal to said first switching means to alternately connect and disconnect said solenoid coil to and from the storage capacitor in response to the magnitude of said current respectively falling below and rising above a third and fourth preselected level, said third and fourth preselected levels being less than both of said first and second preselected levels;

fifth means for preventing delivery of said third control signal for a second preselected duration of time in response to receiving said first control signal;

sixth means for preventing delivery of said first control signal for a third preselected duration of time after termination of said second preselected duration of time; and

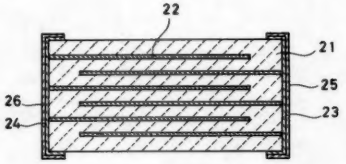
means for discharging said solenoid coil to said storage capacitor in response to disconnecting said solenoid coil from both said storage capacitor and system ground.

4,604,676

CERAMIC CAPACITOR

Atsuo Senda; Toshi Numata; Takuji Nakagawa, and Yoshifumi Ogiso, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 30, 1985, Ser. No. 782,217
Claims priority, application Japan, Oct. 2, 1984, 59-207363; Oct. 2, 1984, 59-207364; Oct. 2, 1984, 59-207365; Oct. 2, 1984, 59-207366; Oct. 2, 1984, 59-207369; Dec. 28, 1984, 59-281814; Dec. 28, 1984, 59-281815; Apr. 30, 1985, 60-94079
Int. Cl.⁴ H01G *1/14, 4/10*
U.S. Cl. 361—309 **12 Claims**



1. A ceramic capacitor formed by a laminated dielectric ceramic element assembly comprising:

a dielectric ceramic member consisting of a plurality of layers of metal oxide, respective said layers being not more than 50 μm in thickness; and

a plurality of layers of inner metal electrodes laminated with each other through said dielectric ceramic member to form electrostatic capacity,

metal electrodes for external connection being formed on said dielectric ceramic element assembly to be connected with prescribed ones of said inner metal electrodes for obtaining electrostatic capacity,

conductive metal oxide layers being formed between said dielectric ceramic element assembly and said metal electrodes for external connection for preventing reduction of said metal oxide forming said dielectric ceramic member.

4,604,677

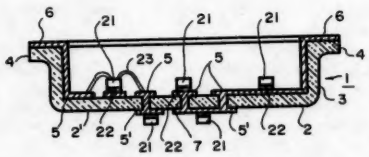
CERAMIC STRUCTURAL BODY AND A METHOD OF MANUFACTURING THE SAME

Go Suzuki, Nagoya, and Kazuo Michisita, Fujiyoshida, both of Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 268,234, May 29, 1981, abandoned, which is a continuation of Ser. No. 970,444, Dec. 18, 1978, abandoned. This application Aug. 16, 1983, Ser. No. 525,250
Claims priority, application Japan, Dec. 23, 1977, 52-174414
Int. Cl.⁴ H05K *1/18*
U.S. Cl. 361—393 **9 Claims**

1. A ceramic package comprising a single monolithic ceramic sheet formed into a primary ceramic body having a

recess portion therein with a flange portion disposed at the edge of said recess portion, at least one metallized chip member on an inner bottom surface of the recess portion for mounting an electronic device thereon, and a plurality of metallized layers extending from the inner bottom surface to the flange portion thereof and comprising a conductive path to connect



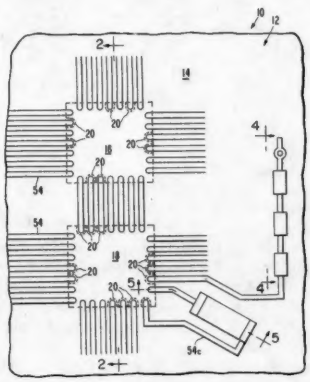
the electronic device to external circuits, further comprising a plurality of metallized conductive layers provided on an outer bottom surface of the ceramic body and a plurality of through-holes extended through the bottom surface, the metallized conductive layers being electrically connected to the metallized layers on the inner bottom surface through the through-holes.

4,604,678

CIRCUIT BOARD WITH HIGH DENSITY ELECTRICAL TRACERS

George R. Hagner, San Jose, Calif., assignor to Frederick Parker, San Jose, Calif.

Filed Jul. 18, 1983, Ser. No. 515,008
Int. Cl.⁴ H05K *1/18*
U.S. Cl. 361—401 **4 Claims**



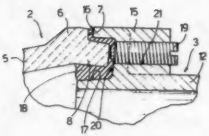
1. An electrical circuit board comprising: a substrate having a surface provided with a plurality of grooves; a number if discrete electrical components adapted to be carried by the substrate near the surface thereof and to be coupled together to form an electrical current carrying path, each component having a pair of terminals; and a plurality of electrically conductive traces in respective grooves and interconnecting the terminals of the components in a manner to form said electrical current carrying path, each trace having a depth, the depth of at least certain of the traces being a number of times greater than the width of the traces, each groove having a bottom and a pair of sides, each trace being a mass of electrically conductive material substantially filling the respective

4,604,679

METHOD OF ASSEMBLING A MOTOR VEHICLE HEADLIGHT, AND HEADLIGHT PRODUCED USING SUCH A METHOD

Giovanni Rolando, and Giorgio Manunta, both of Turin, Italy, assignors to Carello Industriale, S.p.A., Turin, Italy

Filed Mar. 6, 1985, Ser. No. 708,819
Claims priority, application Italy, Mar. 13, 1984, 67237 A/84
Int. Cl.⁴ F21V *21/29*
U.S. Cl. 362—277 **6 Claims**



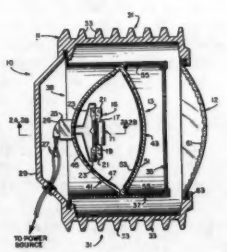
1. A method for assembling a motor vehicle headlight having a transparent front member provided with a rear, peripheral annular edge, and a rear parabola reflector provided with an axial front annular groove and at least three adjustable pins extending through the bottom of said groove along axes essentially parallel with the optical axis of said reflector, comprising inserting the rear, peripheral annular edge of said transparent front member into the axial front annular groove of said reflector, adjusting said adjustable pins along their axes, bringing them into contact with the rear edge of said transparent member and providing a supporting surface therefor, and feeding bonding and sealing material into said groove and into contact with the ends of said pins and locking said rear edge in said groove.

4,604,680

INFRARED FLOODLIGHT

Robert E. Levin, S. Hamilton, and George J. English, Reading, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 25, 1985, Ser. No. 727,961
Int. Cl.⁴ F21V *9/00*
U.S. Cl. 362—293 **29 Claims**



1. An infrared floodlight comprising:

a light source for providing infrared radiation;

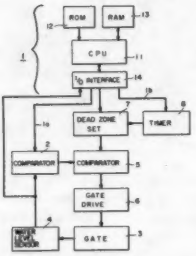
means located substantially on one side of said light source for reflecting infrared radiation from said light source and for transmitting visible radiation from said light source therethrough; and

means secured to or forming part of said infrared reflecting means to provide a closure therefor, said closure means transmitting infrared radiation from said light source and from said infrared reflecting means therethrough and reflecting visible radiation toward said infrared reflecting means.

4,604,681
FEEDBACK CONTROL METHOD AND SYSTEM HAVING VARIABLE DEADBAND

Ryuji Sakashita, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 454,569, Dec. 29, 1982, abandoned. This application Aug. 13, 1985, Ser. No. 765,189
Claims priority, application Japan, Mar. 5, 1982, 57-35381
Int. Cl.[4] G06F *15/20*; G05B *11/01*; E02B *7/20*
U.S. Cl. 364—183 **20 Claims**



18. Apparatus for controlling a parameter with an actuator in response to an indication of a value of the parameter comprising:

(a) means for establishing a target value for the parameter,

(b) means for setting an initial dead band zone including the set point value for the actuator at the time the target value is established,

(c) means for gradually reducing in only a monotonic manner the width of the dead band zone for the established target value from the initial dead band zone as control time for the parameter increases, whereby the dead band zone has a time dependent gradually decreasing monotonic variable value,

(d) means for comparing the monitored and target values for the parameters to derive an indication of an error between them,

(e) means for comparing the indicated error between the monitored and target values with the time dependent gradually decreasing monotonic variable value for the dead band zone, and

(f) means responsive to comparing means (e) for controlling said actuator so the parameter is varied toward the target value only when the error indication derived by comparing means (d) is greater than the time dependent gradually decreasing monotonic variable for the dead band.

4,604,682
BUFFER SYSTEM FOR INTERFACING AN INTERMITTENTLY ACCESSING DATA PROCESSOR TO AN INDEPENDENTLY CLOCKED COMMUNICATIONS SYSTEM

Herbert A. Schwan, and Eduard A. Schwan, both of Encinitas, Calif., assignors to Teleplex Corporation, San Diego, Calif.

Filed Sep. 30, 1982, Ser. No. 430,404
Int. Cl.[4] G06F *13/18, 13/00*
U.S. Cl. 364—200 **18 Claims**

1. A buffer system for interfacing an intermittently accessing data processor to a communications system in which the transfer of data bits is clocked at a predetermined rate in response to clock pulses provided by a communications system clock signal comprising

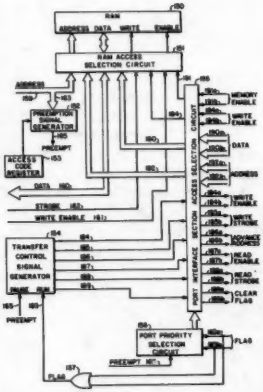
a random access memory (RAM) for storing all input signal data bytes received from an input communications channel of the communications system and for storing all output signal data bytes for transmission to an output communications channel of the communications system;

means connected to the RAM for connection to said data processor for enabling the data processor to access the RAM at any time to retrieve input signal data bytes from the RAM and to store output signal data bytes in the RAM, said connecting means including a preemption signal generator for providing a preemption signal during the interval that the RAM is accessed by the data processor;

a port interface section responsive to the system clock signal for receiving and storing an input signal data byte from the input channel, for transmitting an output signal data byte to the output channel and for providing a flag signal to demarcate the data bytes;

means responsive to each preemption signal for preventing connection of the port interface section to the RAM during the interval that the RAM is accessed by the data processor; and

a transfer control signal generator for responding to the flag signal by generating the following sequence of transfer control signals:



a write enable signal provided to the port interface section for enabling the input signal data byte stored therein to be written into the RAM;

a write strobe signal provided to the RAM for causing the RAM to store the input signal data byte from the port interface section;

a read enable signal provided to the RAM for enabling an output signal data byte stored therein to be read therefrom;

a read strobe signal provided to the port interface section to cause the port interface section to read the stored output signal data byte from the RAM; and

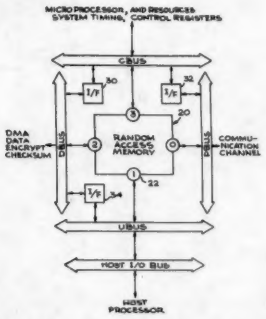
a clear flag signal provided to the port interface section for terminating the flag signal;

wherein the transfer control signal generator is connected to respond to each preemption signal by interrupting its sequential generation of transfer control signals during the interval of the preemption signal and to respond to the termination of the preemption signal by resuming said sequential generation of transfer control signals at the point of interruption.

4,604,683
COMMUNICATION CONTROLLER USING MULTIPORTED RANDOM ACCESS MEMORY

Roger R. Russ, Santa Barbara, and Arthur C. Berggreen, Goleta, both of Calif., assignors to Advanced Computer Communications, Santa Barbara, Calif.

Filed Dec. 10, 1984, Ser. No. 679,809
Int. Cl.[4] G06F *13/12*
U.S. Cl. 364—200 **16 Claims**



1. A communications controller useful for processing digital data supplied by a host processor and a communications network in accordance with defined protocal rules and for transferring the processed data to said network and processor, respectively, said controller comprising:

random access memory means including a memory array, memory bus means, and arbitration logic means;

microprocessor means operable to supply memory access instructions;

first bus segment means connecting said microprocessor means to said arbitration logic means;

second bus segment means for connecting said communications network to said arbitration logic means;

third bus segment means for connecting said host processor to said arbitration logic means;

each of said second and third bus segment means having a component means connected thereto for supplying memory access instructions;

said arbitration logic means including means responsive to memory access instructions supplied by said first, second, and third bus segment means for coupling a selected one of said bus segment means to said memory bus means for reading data from or writing data into said memory array; and

program memory means storing said protocol rules coupled to said microprocessor means for causing said microprocessor means to selectively modify data written into said memory array by said second and third bus segment means.

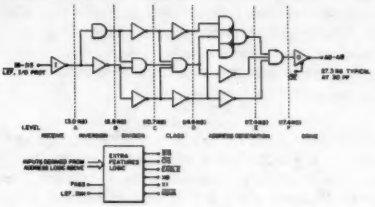
4,604,684
DIGITAL COMPUTER HAVING UNIQUE INSTRUCTION DECODING LOGIC

David I. Epstein, Framingham, Mass., assignor to Data General Corp., Westborough, Mass.

Filed Nov. 15, 1983, Ser. No. 552,207
Int. Cl.[4] G06F *9/28*
U.S. Cl. 364—200 **7 Claims**

1. A method of increasing speed of instruction decoding in a microcode-controlled digital computer, comprising the steps of:

employing a gate array comprising on a single chip and in a single encapsulation the gating necessary to decode the operation code of an instruction; and,

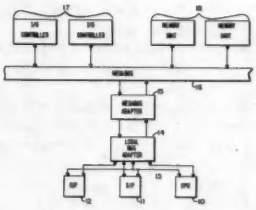


producing from said gate array the control store address of a sequence of microinstructions that will effect the operation specified by said instruction.

4,604,685
TWO STAGE SELECTION BASED ON TIME OF ARRIVAL AND PREDETERMINED PRIORITY IN A BUS PRIORITY RESOLVER

Richard P. Brown, Acton; Richard A. Lemay, Carlisle; G. Lewis Steiner, Milford, and William E. Woods, Natick, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 350,537, Feb. 19, 1982, abandoned.
This application Oct. 9, 1984, Ser. No. 659,012
Int. Cl.[4] G06F *9/46*
U.S. Cl. 364—200 **12 Claims**



1. In combination with a computer system having a common shared unit and further having a plurality of devices coupled to the common shared unit, each device having an assigned priority for accessing the common shared unit, each device competing with each other for access to said shared unit, a priority resolver for providing unambiguous resolution of requests by the devices for access to the shared unit during a first service cycle, said priority resolver comprising:

(a) first means including a plurality of storage elements, each having first and second states for storing a request received from one of said devices for access to said shared unit, all storage elements being connected to receive in parallel all requests from said plurality of devices in a predetermined common time period;

(b) second means coupled to said first means for determining priority access to the common shared unit based upon time of arrival of the request wherein state changes of higher priority storage elements are disabled with prior receipt of a request by any lower priority storage element;

(c) third means coupled to said first means for determining priority access to the common shared unit based on the assigned priority of the device making a request for access to the common shared unit by comparing priority of the stored requests and providing an output indicative of the highest priority request stored in one of the storage elements;

(d) fourth means coupled to said third means for selecting

the highest priority device indicated by the output of the third means for communication with the shared unit; and

(e) fifth means for resetting the first means to terminate a conflict resolver interval with each selection of a device, whereby one device is serviced per priority interval and a highest priority device will never have to wait more than one service cycle to gain access to the shared unit.

4,604,686

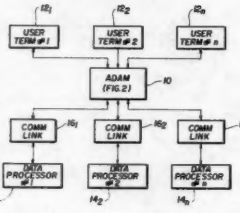
ASSOCIATIVE DATA ACCESS METHOD (ADAM) AND ITS MEANS OF IMPLEMENTATION

Bernadette G. Reiter, Longmont; John W. Castor, Pine; R. J. Carter Blume, Aurora; Roy A. Schewe, Boulder, and Leonard D. Shepley, Littleton, all of Colo., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jan. 27, 1984, Ser. No. 574,438

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **27 Claims**



1. A method of integrating data in a distributed processing environment, comprising the steps of:

(a) coupling at least one user terminal to a plurality of mutually diverse type data processors through an intelligent interface;

(b) loading said interface with information for coupling to and retrieving data from each of said data processors;

(c) operating said interface as an asynchronous terminal, thereby emulating a dumb terminal, in accordance with said information loaded therein and selectively coupling to and accessing said data processors for predetermined data via a communications link;

(d) retrieving and returning said predetermined data to said interface via said communications link;

(e) integrating said data retrieved from said plurality of mutually diverse type data processors at said interface comprising the steps of consolidating the data received from said diverse type processors and reformatting the data into a common format following said consolidating step; and

(f) reporting said data thus integrated to said user terminal in a user friendly form.

4,604,687

METHOD AND SYSTEM FOR STORING AND RETRIEVING MULTIPLE CHANNEL SAMPLED DATA

Curtis W. Abbott, San Rafael, Calif., assignor to Lucasfilm Ltd., San Rafael, Calif.

Filed Aug. 11, 1983, Ser. No. 522,024

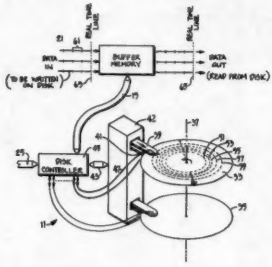
Int. Cl.[4] G06F *13/00*; G11B *3/74*

U.S. Cl. 364—200 **20 Claims**

1. In a random access rotating disk digital data storage system wherein successive blocks of data of at least two data files are recorded in a pattern of a plurality of concentric circular tracks on said disk, each of said plurality of tracks having a plurality of sectors therearound for receiving said data and with one of said sectors at a particular rotational position of each such track designated to receive the beginning of a block of data, an improved method of positioning the recorded blocks of data on said circular tracks in order to reduce rotational latency, comprising the steps of:

recording the successive blocks of data for said at least two data files in physically non-sequential scattered positions in said circular tracks, and

beginning the recording of blocks of data in each of said plurality of tracks at its said beginning sector, the beginning sector of each of said plurality of tracks on said disk



being fixed at one of at least two different rotational positions with respect to said disk, wherein the different rotational positions of the beginning sectors are N in number and the beginning sector for substantially any given track is given by (S/N) (cyl. modulo N), where S is the total number of sectors in the given track and "cyl. modulo N" is the remainder resulting from dividing the track number by N.

4,604,688

ADDRESS TRANSLATION BUFFER CONTROL SYSTEM

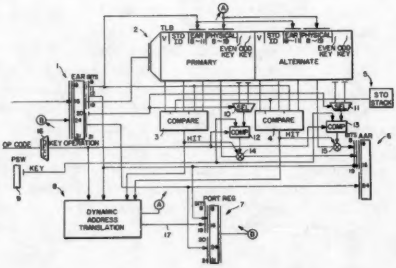
Hirosada Tone, Fuchu, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 30, 1983, Ser. No. 509,868

Claims priority, application Japan, Jun. 30, 1982, 57-113310

Int. Cl.[4] G06F *12/10, 12/14*

U.S. Cl. 364—200 **3 Claims**



1. An address translation control system for storage access instructions including a first instruction requiring a storage protection check prior to storage accessing and a second instruction not requiring a storage protection check prior to storage accessing, said system comprising:

an effective address register for storing an effective address;

a decoder for decoding the storage access instructions;

a result register, connected to said effective address register, for storing a physical address;

translation buffer means, connected to said effective address register, said decoder and said result register, for storing physical addresses corresponding to effective addresses and for providing a hit signal when the physical address

corresponding to the effective address stored in the effective address register is stored therein and the storage protection check is successful, and for providing the physical address to said result register as a result of the hit signal;

dynamic address translation means, connected to said effective address register, said decoder and said translation buffer means, providing a physical address in dependence on the first or second instruction being decoded and providing the physical address to said translation buffer means in dependence upon the first instruction being decoded; and

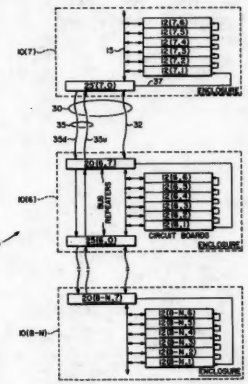
a port register, connected to said effective address register and said dynamic address translation means, for passing the physical address directly to said effective address register from said dynamic address translation means in dependence upon the second instruction being decoded.

4,604,689

BUS REPEATER

John P. Burger, Sunnyvale, Calif., assignor to Convergent Technologies, Inc., San Jose, Calif.

Filed Apr. 15, 1983, Ser. No. 485,557
Int. Cl.[4] G06F *13/36, 13/40*
U.S. Cl. 364—200 **10 Claims**



1. A computer system comprising:

a plurality of N enclosures, each having a motherboard carrying bused address and data lines for communication to at least one circuit board within the enclosure, and having means for generating local busy and request signals;

N-1 downstream bus repeaters, each being located at the downstream end of the motherboard of a corresponding one of enclosures **1** . . . , N-1;

N-1 upstream bus repeaters, each being located at the upstream end of the motherboard of a corresponding one of enclosures **2** . . . , N; and

N-1 connector cables for serially coupling said enclosures, each connector cable coupling the downstream bus repeater in a corresponding enclosure to the upstream bus repeater in the serially adjacent enclosure, the cable that is coupled to the upstream or downstream bus repeater of a particular enclosure being designated the upstream or downstream cable, as the case may be, for that particular enclosure;

each connector cable having a first set of lines corresponding to said address and data lines and a second set of private lines having a first subset of private lines for passing downstream-bound private signals and a second subset of private lines for passing upstream-bound private signals;

said first subset of private lines including lines for passing downstream-bound busy and request signals, the downstream-bound busy and request signals arriving at a particular enclosure being representative of the status of bus use and bus requests for all enclosures, if any, upstream of that particular enclosure;

said second subset of private lines including lines for passing upstream-bound busy and request signals the upstream-bound busy and request signals arriving at a particular enclosure being representative of the status of bus use and bus requests for all enclosures, if any, downstream of that particular enclosure;

wherein the upstream and downstream bus repeaters in a given enclosure include between them the following

buffering means for coupling the data and address lines of said given enclosure to the connector cable or cables coupled to said given enclosure, thereby defining a system bus in which inter-enclosure communication can occur,

means for receiving said downstream-bound busy and request signals on the first subset of private lines of the upstream cable, if any, for said particular enclosure,

means for sensing the local busy and request signals within said given enclosure;

means for combining the local busy and request signals in said given enclosure with said downstream-bound busy and request signals arriving at said given enclosure to generate updated downstream-bound busy and request signals representative of the status of bus use and bus requests for all enclosures upstream of and including said given enclosure,

means for placing said updated downstream-bound busy and request signals on the first subset of private lines of the downstream cable, if any, for said given enclosure,

means for receiving said upstream-bound busy and request signals on the second subset of private signal lines of the downstream cable, if any, for said particular enclosure,

means for combining the local busy and request signals in said given enclosure with said upstream-bound busy and request signals arriving at said given enclosure to generate updated upstream-bound busy and request signals representative of the status of bus use and bus requests for all enclosures downstream of and including said given enclosure,

means for placing said updated upstream-bound busy and request signals on the second subset of private lines of the upstream cable, if any, for said given enclosure, and

request monitoring circuitry, responsive to said upstream-bound and downstream-bound private signals arriving at said given enclosure and to the local request signal, for determining according to a defined protocol whether another enclosure has higher priority than the given enclosure for bus use.

4,604,690

DYNAMIC CONFIGURATION FOR ADDED DEVICES

Robert P. Crabtree, Colleyville, and Keith F. Kelly, Jr., Dallas, both of Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 468,514, Feb. 22, 1983, abandoned.
This application Sep. 3, 1985, Ser. No. 771,801
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **7 Claims**

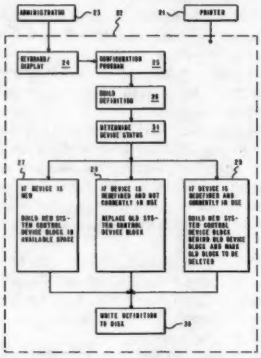
1. A method of on-line reconfiguring a data processing system for an added or redefined device, said method comprising:

(a) building a definition for said device based on input to a configuration program;

(b) determining a status of said devices as being new, redefined and not currently in use, or redefined and currently in use; and

(c) building and storing a control block in main storage for said data processing system if said defined device is new, building a redefined control block and replacing a control

block for the device in main storage if said device is redefined and not currently in use, or building a redefined control block and storing it in main storage to be substituted at a later time if said device is redefined and currently in use, all said building, storing or replacing steps being performed during the operation of said data processing system.

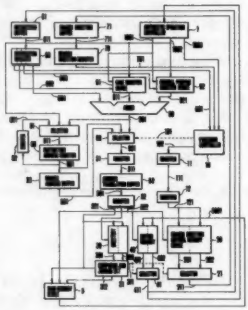


4,604,691

DATA PROCESSING SYSTEM HAVING BRANCH INSTRUCTION PREFETCHING PERFORMANCE

Masanobu Akagi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,709
Int. Cl.[4] G06F *9/42*
U.S. Cl. 364—200 **7 Claims**



1. A data processing systems having a branch instruction prefetching performance, said system comprising:

main memory means (5) for storing information;

buffer memory means (30, 40; 130, 140) coupled to said main memory means having a plurality of blocks for holding a copy of a portion of the information stored in said memory means (5) in said plurality of blocks;

arithmetic operation control means (1) for executing instructions including a branch instruction;

branch direction control memory means (2) coupled to said main memory means including at least one block corresponding to at least one of said blocks of said buffer memory means for storing a branch direction information obtained by execution of said branch instruction in a block in said branch direction control memory means corresponding to the block containing said branch instruction of said buffer memory means; and

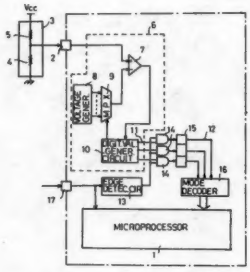
preceding control means (10) coupled to said branch direction control memory means and said buffer memory means including means for reading out from said branch direction control memory means said branch direction information and for reading out from said buffer memory means an instruction to be prefetched wherein a common directory means (30) is used for said branch direction control memory means and for said buffer memory means, means for predicting whether a branching will be successful or not based on the branch direction information stored in said branch direction control memory means when said instruction to be prefetched is a branch instruction, and means responsive to a result of said prediction for prefetching an instruction in a direction having a highest probability of being executed after said branch instruction has been executed.

4,604,692

OPERATION MODE SETTING SYSTEM FOR A MICROPROCESSOR

Joji Murakami, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 29, 1982, Ser. No. 454,258
Claims priority, application Japan, Dec. 29, 1981, 56-213710
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 **6 Claims**



1. An operation mode setting system for a microprocessor operable in a plurality of operation modes, said operation mode setting system comprising in a single integrated circuit:

a microprocessor having a plurality of operation modes;

a reset input terminal connected to said microprocessor for receiving a reset signal;

a mode input terminal for receiving an analog voltage the amplitude of which determines exclusively a corresponding one of said plurality of operation modes;

an analog-to-digital converter means connected to said mode input terminal for converting said analog voltage to a digital signal representative of the amplitude thereof;

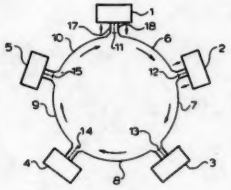
a decoder means connected to said analog-to-digital converter means for decoding said digital signal and connected to said microprocessor for generating a signal for setting said microprocessor at said one of said plurality of operation modes corresponding solely to the amplitude of said analog voltage; and

means responsive to a reset signal applied to said reset input terminal for applying said decoded signal to said microprocessor to set the operation mode thereof when a reset signal is applied.

4,604,693
SYSTEM AND METHOD FOR COMMUNICATION BETWEEN NODES OF A CLOSED LOOP LOCAL COMMUNICATION PATH

George E. Chadima, Jr., and Joseph J. Kubler, both of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Division of Ser. No. 289,098, Jul. 31, 1981, Pat. No. 4,430,700.
This application Oct. 24, 1983, Ser. No. 544,969
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—200 11 Claims



1. In a closed loop data processing network,

(a) a series of nodes having data processing units associated therewith each having a data input and a data output, and requiring at least one processing step in transmitting data between its data input and its data output, said nodes being selectively operable for sending a bid message seeking control of communication,

(b) a series of communication links coupling the nodes in a loop communications path for enabling data communication therebetween, and including an incoming link path and an outgoing link path at each node,

(c) transmission link switches at the respective nodes each having a first transmission mode and a second cutoff mode,

(d) each transmission link switch in said first transmission mode providing a switch path directly coupling the incoming and outgoing link paths at the respective associated node so as to provide for undelayed date transmission independent of the data processing unit associated with the node,

(e) each transmission link switch in said cutoff mode serving to interrupt said switch path such that the incoming and outgoing link paths at the respective associated node are not coupled via said switch path but are only coupled via the data input and the data output of the associated data processing unit, and

(f) control means associated with each data processing unit for placing the associated transmission link switch is cutoff mode during the transmission of a data message from the data processing unit, while assuring against a communications gap of a predetermined time duration during reception of a response to the transmitted data message,

(g) said control means associated with each data processing means being free of a common timing control common to said series of nodes and whenever ready to initiate communication with any other node being operable in response to a communications gap of the predetermined time duration occurring at any time to immediately place the associated transmission link switch in the cutoff mode in preparation for sending a bid message over the same communication path as data messages are transmitted.

4,604,694
SHARED AND EXCLUSIVE ACCESS CONTROL

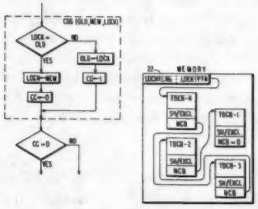
Roger E. Hough, Highland, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,613
Int. Cl.[4] G06F *9/46*
U.S. Cl. 364—200 27 Claims

1. A method for aquisition and release of access to each of plural resources in a multi-programming system, the method comprising:

providing a first-in/first-out (FIFO) queue of elements in which each element is respectively associated with a request waiting for access to a resource,

associating each resource with a respective lockfield in a location known by and accessible to all programs wanting to use the resource, said lockfield containing a lockflag and a lockpointer, the lockflag indicating a type of access granted to said resource, and the lockpointer locating a most recently enqueued element in the queue, the lockpointer indicating whether or not a queue exists, and if the queue exists identifying the most recently enqueued element, each element in the queue (except a least recently enqueued element) having a pointer to a next less recently enqueued element in the queue, and the pointer for the



least recently enqueued element having an indicator identifying the element as the least recently enqueued element,

granting one or more share requests for non-exclusive use of the resource to concurrently access the resource, but allowing only a single exclusive request for exclusive use of the resource to access the resource at a time,

controlling the lockflag to indicate the type of access currently granted to the resource, in which the lockflag is set to one of the following states: (1) a shareable usage state, (2) an exclusive usage state, or (3) a no existing access state representing no assignment of the resource to any request,

providing a shareable or exclusive usage indicator field in each element in the queue for indicating whether a request associated with the element is waiting for shareable or exclusive usage of the resource when the usage would conflict with access to the resource by previous requests not yet released.

4,604,695
NIBBLE AND WORD ADDRESSABLE MEMORY ARRANGEMENT

Melinda A. Widen, Arlington; John J. Bradley, Framingham, and George M. O'Har, Chelmsford, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1983, Ser. No. 537,928
Int. Cl.[4] G06F *12/04*
U.S. Cl. 364—200 7 Claims

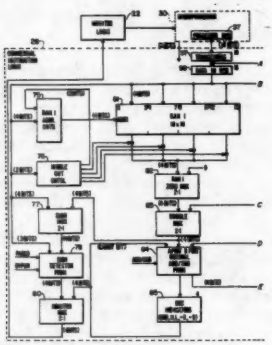
1. An auxiliary memory arrangement for use with a central processing unit (CPU), said CPU capable of performing operations in response to software instructions, said software instructions specifying the type of operation to be performed and one or more operands, each said operand being stored in a large memory, said auxiliary memory arrangement comprising:

A. a memory means having storage bits which are organized in groups called words with each word being made up of a plurality of nibbles and each nibble being made up of a predetermined plurality of said storage bits, and each of said words is used to store an operand from said large memory, a data input to said memory means for accepting operands and nibble size parts thereof to be stored in word and nibble locations therein, a data output from said memory means for providing the operand bits stored in ones of said words read from said memory means, an address

input to said memory means to which are applied addresses indicating which words and nibbles in said memory means are to have operands or nibbles thereof written therein or read therefrom;

B. an address counter having an input and an output which is coupled to said address input of said memory means, said address counter input receiving an initial word address which is stored in said address counter, said initial word address stored in said address counter being incremented in response to an increment address signal and being decremented in response to a decrement address signal to thereby increment or decrement the word address stored in said address counter and identify words in which one or more of the nibbles are to be written into or read out;

C. a nibble control having an input and an output, said nibble control input for receiving an initial nibble address which indicates one of the plurality of nibbles within a word being addressed by a word address on the output of said address counter, the output of said nibble control for providing the nibble address stored therein to the address input of said memory means along with the word address to indicate nibbles to be written into or read out of said memory means, said nibble control being incremented in response to an increment nibble signal and decremented in response to a decrement nibble signal to thereby sequentially address nibbles within an addressed word; and



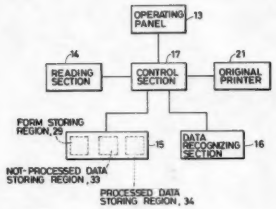
D. a step address means having an input for receiving said increment nibble signal and said decrement nibble signal, and having an output coupled to said address counter for incrementing and decrementing said address counter, said step address means output providing said increment address signal to said address counter if said step address means increments through a count corresponding to the last nibble of the plurality of nibbles within a word being addressed by said address counter, and said step address means output providing said decrement address signal to said address counter if said step address means decrements through a count corresponding to the first nibble of said plurality of nibbles within the word being addressed by said address counter; whereby operands and nibble size parts thereof are written in or read from consecutive words and nibbles in said memory means by incrementing or decrementing both word addresses stored in said address counter and nibble addresses stored in said nibble control.

4,604,696

DOCUMENT ISSUING APPARATUS FOR PRINTING A SET OF TRANSACTION CONTROL SLIPS FOR EACH OF MANY TRANSACTIONS

Saburo Suganuma, and Hiroyuki Kataoka, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,568
Claims priority, application Japan, Feb. 10, 1983, 58-19792
Int. Cl.[4] G06F *15/22*
U.S. Cl. 364—401 **4 Claims**



1. A document issuing apparatus for printing item sale and delivery control information for each of a plurality of transactions, involving the sale and delivery of an item, which information is presented on an order form for each of a plurality of transactions, onto an individual set of transaction control slips for each transaction, said apparatus comprising:

(a) optical means for reading from a plurality of said order forms, item sale and delivery control data representing transaction control information for a plurality of transactions, said control data including item classification data;

(b) storage means for storing said sale and delivery control data;

(c) processing means for ordering said sale and delivery control data for said plurality of transactions in response to said classification data contained in said transaction control information for each transaction, and for organizing said sale and delivery control data for each transaction into a format compatible with the format of said transaction control slips; and

(d) printing means for simultaneously printing both said transaction control information for each transaction and format data representing the format of said control slips to form a set of said transaction control slips for each transaction, said set of transaction control slips being printed in an order determined by said classification data for each transaction.

4,604,697

BODY IMAGING USING VECTORIAL ADDITION OF ACOUSTIC REFLECTION TO ACHIEVE EFFECT OF SCANNING BEAM CONTINUOUSLY FOCUSED IN RANGE

Ajay K. Luthra; Saleem Kassam, both of Bala Cynwyd, and Richard B. Bernardi, Strafford, all of Pa., assignors to Interspec, Inc., Conshohocken, Pa.

Filed Aug. 5, 1983, Ser. No. 520,573
Int. Cl.[4] G01N *29/00*
U.S. Cl. 364—414 **16 Claims**

1. An ultrasonic imaging system comprising:

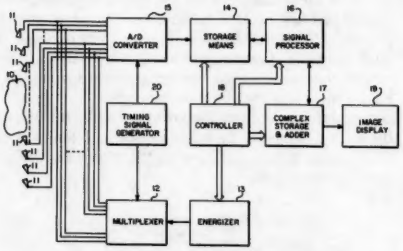
an array of electro-acoustic transducers for transmitting acoustic energy upon a body to be displayed and for receiving reflections from said body to develop output signals representative of said reflections and which contain complex information corresponding to the amplitudes and phases of said reflections;

an image display for presenting an image, composed of a plurality of varying intensity pixels, of said body;

means for selectively energizing said transducers to develop a series of acoustic energy transmissions from said array

and to develop output signals from said transducers from reflections of said transmissions;

means for processing said output signals, after selected acoustic energy transmissions, to develop from the preceding acoustic energy transmissions a plurality of complex image signals individually representative of the sum of the amplitude and phase information associated with individual pixels and collectively representative of a complex image for the preceding acoustic energy transmissions,



means for combining complex image signals associated with the same pixel of each complex image to develop a plurality of image display signals representative of the combined amplitude and phase information of each pixel for all preceding acoustic energy transmissions; and

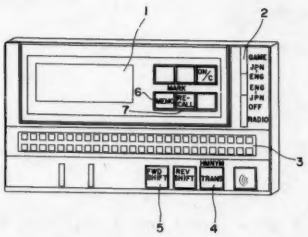
means for supplying said image display signals to said image display, thereby presenting an image of said body.

4,604,698

ELECTRONIC TRANSLATOR

Yutaka Ikemoto, Nara, and Ken Sawada, Ikoma, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1983, Ser. No. 564,204
Claims priority, application Japan, Dec. 28, 1982, 57-228792
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—419 **9 Claims**



5. An electronic translator comprising:

first memory means for storing words of a first language and words of a second language wherein each word of the first language is stored in an interlinked manner with at least one word of the second language, at least one of the words in said first language having more than one meaning and being interlinked with more than one word of said second language, each said word of said second language interlinked with said word in said first language, indicating a different meaning of said word in said first language having more than one meaning;

input means for introducing a word of the first language;

search means for searching for said introduced work in said first memory means;

first producing means for recalling a word of the second language from said first memory means having a said interlinked relationship with said introduced word of said first language;

second producing means for recalling said word of the first language from said first memory means having the said interlinked relationship with said word recalled by said first producing means;

means for providing a comment representative of the meaning of said word of the second language recalled by said first producing means; and

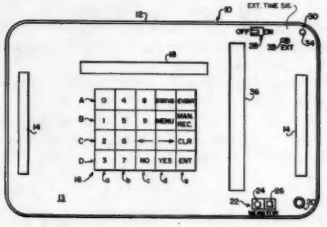
means for indicating said introduced word, said second language word recalled by said first producing means, said word in said first language recalled by said second means, and said comment.

4,604,699

GENERAL EARTHQUAKE OBSERVATION SYSTEM

Roger D. Borcherdt, Mountain View; Jon P. Fletcher; Richard E. Warrick, both of Palo Alto; Gary L. Maxwell, Menlo Park; Edward G. Jensen, Newark, and John V. Schaack, Cupertino, all of Calif., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 25, 1984, Ser. No. 573,775
Int. Cl.[4] G01V *1/00*; G01W *1/10*
U.S. Cl. 364—420 **15 Claims**



1. A computer system for monitoring analog signals produced by a plurality of transducers, the system comprising:

a computer bus;

a microcomputer comprised of a microprocessor and program memory connected to said computer bus, said program memory for storing software that controls operation of said microprocessor, which programmed microprocessor in turn controls the operation of said system;

a plurality of software selectable input channels connectable to the transducers, each channel comprising amplifiers and software selectable filters;

an analog to digital converter coupled to a selected input channel for converting analog data from said selected input channel to digital data;

a Direct Memory Access data bus;

Direct Memory Access data memory connected to said data bus;

a controller for initiating a Direct Memory Access data transfer of said digital data from said converter to said data memory through said data bus;

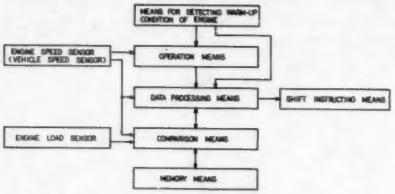
a data recorder connected to said data bus; and

means for automatically storing said digital data on said data recorder.

4,604,700
APPARATUS FOR INDICATING AN OPTIMUM TIME TO SHIFT A MANUAL TRANSMISSION INSTALLED IN A VEHICLE

Kohei Igarashi, Susono, and Kazuo Tomita, Gotenba, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 19, 1983, Ser. No. 533,560
Claims priority, application Japan, Feb. 25, 1983, 58-031132
Int. Cl.⁴ B60K *41/18*; G07C *5/08*; G09B *19/16*
U.S. Cl. 364—424 **21 Claims**



1. An apparatus for indicating an optimum time to shift a manual transmission installed in a vehicle comprising:

a first detecting means for detecting an actual engine speed;

a second detecting means for detecting an actual engine load;

a third detecting means for detecting an actual engine temperature;

memory means for storing a plurality of optimum relationships between engine speed, engine load and engine temperature each of said plurality of optimum relationships including a shift-up zone;

comparison means for comparing an actual relationship between said actual engine speed, said actual engine load, and said actual engine temperature plurality of optimum relationships between engine speed, engine load and engine temperature and outputting a shift-up signal when the actual relationship is in the shift-up zone of one of said plurality of optimum relationships; and

instruction means for indicating a shift-up condition when the comparison means outputs a shift-up signal;

whereby an operator is notified by said instruction means, when said actual relationship is in said shift-up zone of one of said plurality of relationships.

4,604,701
FAIL-SOFT TURBOCHARGER CONTROL SYSTEM

Charles S. Fujawa, and Sara B. Masteller, both of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 16, 1983, Ser. No. 467,070
Int. Cl.⁴ F02B *37/12*; F02D *23/00*; G01M *15/00*
U.S. Cl. 364—431.01 **17 Claims**

10. A fail-soft turbocharger control system for an engine with a first bank and second bank of cylinders and a first turbocharger and second turbocharger associated therewith, each turbocharger having a variable output compressor boosting the pressure of an input manifold to said associated bank of cylinders and a variable input turbine driving said compressor powered by the exhaust gases of said bank of cylinders for said control system comprising:

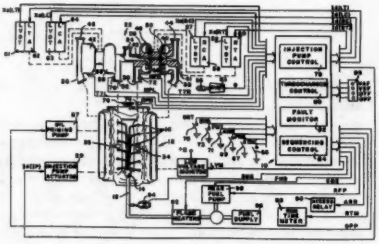
a computing circuit including input circuit means for receiving sensor input signals representative of operational parameters of said engine, programmable memory means for storing predetermined tabular data and sequential and computational instructions, means responsive to said memory means for receiving said input signals and generating a plurality of said output signals as a function of said input signals, tabular data, and instructions, and output circuit means for outputting said plurality of output signals,

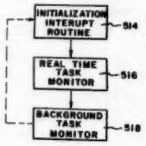
sensor means connected to said engine and said computing circuit for sensing and generating said sensor input signals representative of the manifold pressure, exhaust gas temperature, engine speed, and the position of the throttle, compressor and turbine actuators of said engine,

and actuator means connected to said output circuit means for controlling the position of said actuators in response to predetermined ones of said output signals, respectively,

said computing circuit, sensor means, and actuator means defining a first turbine control loop for regulating the input of exhaust gases to the first turbine as a function of the error difference between the optimum manifold pressure of said first bank of cylinders and the actual manifold pressure of said first bank of cylinders; wherein said optimum manifold pressure is calculated from said stored tabular data and at least one operating parameter of the engine including the speed of the engine;

a first compressor control loop for regulating the output of the airflow from the first compressor as a function of at least one operating parameter of the engine including the speed of the engine;





a second turbine control loop for regulating the input of exhaust gases to the second turbine as a function of the error difference between the optimum manifold pressure of said second bank of cylinders and the actual manifold pressure of said second bank of cylinders; wherein said optimum manifold pressure is calculated from said stored tabular data and at least one operating parameter of the engine including the speed of the engine;

a second compressor loop for regulating the output of the airflow from the second compressor as a function of said stored tabular data and at least one operating parameter of the engine including the speed of the engine;

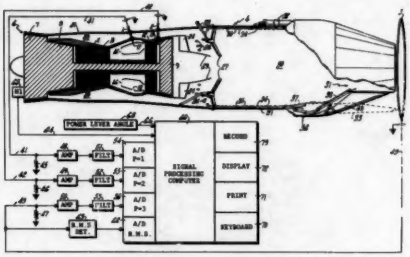
fault testing means for testing the validity of said sensor input signals, said fault testing means including means for determining whether the value of said speed signal is valid before regulating either the first and second turbine inputs or the first and second compressor outputs with that value.

4,604,702

VARIABLE DISCRIMINATORS IN ELECTROSTATIC ENGINE DIAGNOSTICS

Philip E. Zwicke, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,119
Int. Cl.[4] G01M *15/00*
U.S. Cl. 364—431.02 4 Claims



1. Electrostatic diagnostic apparatus for distinctly correlating different events occurring in an operating gas turbine engine, comprising:

electrostatic signal means, including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, a probe signal having a waveshape defined by amplitude variations thereof across a time interval of a given duration in response to electrostatic charge flowing in the gas stream in the vicinity of said probe;

analog to digital converter means connected for response to said electrostatic signal means; and

digital signal processing means connected to said analog to digital converter means

(a) for causing said analog to digital converter means to sample the probe signal provided by said electrostatic signal means in a manner to provide a record of digital signals indicative of the amplitude variations in said probe signal defining the waveshape thereof,

(b) for storing, in response to the amplitude of one of said digital signals being in excess of a threshold magnitude, a record comprising a contiguous sequence of said digital signals sufficient to define the waveshape of said probe signal,

(c) for providing a plurality of groups of predetermined discriminator signals, each of said groups identifying characteristics of the waveshape of a corresponding predetermined paradigm signal representative of a corresponding category which is correlated to a particular corresponding one of a plurality of engine events,

(d) for providing, in response to each record of digital signals, a plurality of groups of acutal signals, each group of actual signals being indicative of the characteristics of the waveshape of said probe signal corresponding to characteristics of said paradigm signal,

(e) for providing, in accordance with a first subroutine first degradation signals indicative of the deviation of said actual signals from a group of said discriminator signals corresponding to a first one of said categories,

(f) for providing, in accordance with said first subroutine, second degradation signals indicative of the deviation of said actual signals from a group of said discriminator signals corresponnding to a second one of said categories, and

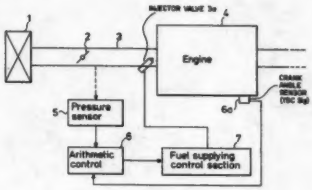
(g) for providing in response to said first and second degradation signals a selected category signal indicative of the one of said categories to which said record of digital signals most nearly correlates.

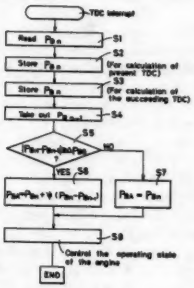
4,604,703

APPARATUS FOR CONTROLLING THE OPERATING STATE OF AN INTERNAL COMBUSTION ENGINE

Shumpei Hasegawa, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,396
Claims priority, application Japan, Apr. 2, 1982, 57-55890
Int. Cl.[4] F02B *3/04;* F02D *41/08, 41/26;* F02M *51/00*
U.S. Cl. 364—431.07 10 Claims





9. A method for controlling an internal combustion engine which operates in accordance with an operating command, and which comprises the steps of:

producing a parameter signal representative of an engine parameter of said internal combustion engine;

sampling said parameter signal at a sampling frequency so as to produce successively appearing sample signals;

storing said sample signals;

producing a first subtraction signal representative of a difference in magnitude between a latest sample signal and a two-times preceding sample signal having appeared two-times before said latest sample signal;

comparing said first subtraction signal with a predetermined value so as to produce a correction command signal when said first subtraction signal exceeds said predetermined level;

producing a second subtraction signal representative of a difference in magnitude between a latest sample signal and a one-time preceding sample signal appearing one time before said latest sample signal;

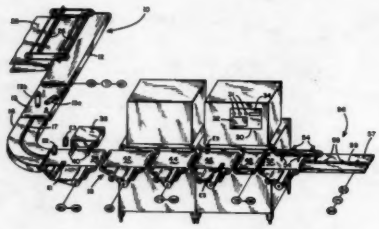
correcting said latest sample signal by adding an additive signal related to said second subtraction signal under the existence of said correction command signal; and

establishing said operating command for the engine in response to the corrected latest sample signal.

4,604,704
HIGH-SPEED MICROPROCESSOR-CONTROLLED BRANCH CONVEYOR

Fred W. Eaves, Clayton, and Wayne D. Sommer, Amery, both of Wis., assignors to Doboy Packaging Machinery, Inc., New Richmond, Wis.

Filed Sep. 10, 1984, Ser. No. 649,173
Int. Cl.[4] G06F *15/20*; B65G *43/10*
U.S. Cl. 364—478 **15 Claims**



1. In a conveyor system, apparatus for randomly receiving product from a longitudinally extending supply conveyor in rows and conveying the product to a selected one of a plurality of work stations by way of a plurality of transversely extending branch conveyor means, each branch conveyor means, comprising:

first conveyor means extending transverse to said longitudinally extending supply conveyor for simultaneously receiving a plurality of products from said supply conveyor, a row at a time, and conveying them in a predetermined orientation with respect to one another and with random spacing therebetween;

second conveyor means disposed downstream from said first conveyor means and electronically feedback coupled to sense the speed of operation of said selected one of said plurality of work stations for accumulating and partially backlogging said products as they are conveyed along said second conveyor means; and

third conveyor means disposed downstream from said second conveyor means and coupled to said selected one of said plurality of work stations for separating each of said products from one another by a predetermined spacing and correctively adjusting said spacing so as to synchronize the position of products spaced on said third conveyor means with a fourth conveyor means of the type having a plurality of spaced-apart pusher members mounted on an endless chain and with adjacent ones of said pusher members defining flights for synchronously receiving said products within said flights and conveying said product to said selected one of said plurality of said work stations.

4,604,705
NUMERICAL CONTROL MACHINING METHOD AND SYSTEM THEREFOR

Kazuo Imanishi, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

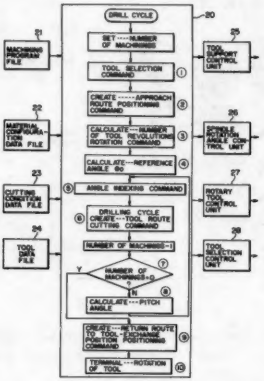
Filed Dec. 29, 1983, Ser. No. 566,937
Claims priority, application Japan, Dec. 29, 1982, 57-232287
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474 **17 Claims**

1. A numerical control machining method of a type in which a workpiece can be machined at plural positions by one or more rotary tools mounted on a movable tool support, comprising the steps of:

(a) entering data describing a configuration of a workpiece to be machined, a machining mode for the machining workpiece, and machining data for machining program execution in correspondence with said machining mode;

(b) computing a safety route of a selected rotary tool from a rest position to a machining start point on said workpiece based upon said data describing said configuration of said workpiece and in accordance with said machining program;

(c) computing a rotation/positioning command for said workpiece with said machining program in response to said machining data;



(d) computing a machining command in response to said machining mode and rotation/positioning command;

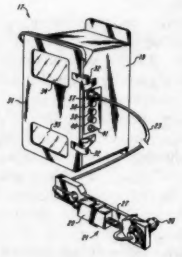
(e) repeating said steps (c) and (d) a number of times corresponding to a number of portions of said workpiece to be machined; and

(f) controlling said tool support, said workpiece, and said rotary tool in accordance with said steps (b) to (e).

4,604,706
APPARATUS FOR FAILURE PREDICTION OF EARTH STRUCTURES

Carl Fisher, Jr., Louisville; Charles R. Carrington, and George A. Grant, both of Longmont, all of Colo., assignors to Integrated Sciences, Inc., Longmont, Colo.

Filed Jun. 27, 1983, Ser. No. 508,344
Int. Cl.[4] G01L *1/26*
U.S. Cl. 364—507 **34 Claims**



1. A device for failure prediction of earth structures, said device comprising:

sensing means for sensing predetermined microseismic emissions of a selected earth structure and responsive thereto providing electrical output signals indicative of predicted failure of said earth structure;

processing means including computer means for receiving said electrical output signals from said sensing means;

control means connected with said computer means for caus-

ing said computer means, responsive to receipt of said electrical output signals from said sensing means to provide an output signal from said processing means indicative of said predicted earth structure failure; and

indicating means connected with said processing means to receive said output signal from said processing means and responsive thereto automatically providing an indication of said predicted structure failure.

4,604,707

DEVICE AND METHOD FOR COMPARING OPTICAL SIGNALS

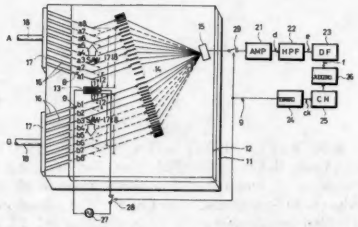
Tsukasa Yamashita, Nara; Nobuhisa Inoue, Kyoto; Kazuhiko Mori, Osaka, and Masaharu Matano, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 3, 1983, Ser. No. 471,728

Claims priority, application Japan, Mar. 12, 1982, 57-39683; Mar. 19, 1982, 57-45449; Mar. 19, 1982, 57-45450

Int. Cl.⁴ G06G *9/00*

U.S. Cl. 364—822 **31 Claims**



1. An optical comparator for comparing two optical digital signals comprising:

optical waveguide means, including an acousto-optical material, for propagating light therethrough;

means for coupling first and second optical digital signals to said waveguide means, said first and second signals each comprising plural optical bits, a one-to-one correspondence existing between the plural bits of said first signal and the plural bits of said second signal;

surface acoustic wave generator means for generating surface acoustic waves and for propagating said waves through the optical waveguide means to impinge upon said first and second signals propagating through said waveguide means at the Bragg angle; and

means for detecting the bits of said first signal which have been diffracted or the undiffracted bits of said first signal and for detecting the bits of said second signal which have been diffracted or the bits of said second signal which have not been diffracted,

wherein the initiation or cessation of interaction between a surface wave produced by said surface acoustic wave generator means and any given one of the plural optical bits of said first signal is simultaneous with initiation or cessation of the interaction of the surface acoustic wave with a corresponding bit of the second optical signal.

4,604,708

ELECTRONIC SECURITY SYSTEM FOR EXTERNALLY POWERED DEVICES

Gainer R. Lewis, 7018 Pacific View Dr., Hollywood, Calif. 90068

Continuation of Ser. No. 328,080, Dec. 7, 1981, abandoned. This application Nov. 8, 1984, Ser. No. 669,727

Int. Cl.⁴ G08B *13/06*; G06F *1/00*; B60R *25/00*

U.S. Cl. 364—900 **16 Claims**

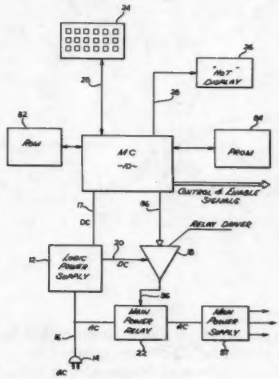
1. A security system including a microcomputer for protecting an externally powered device such that once said device has been enabled it will remain capable of being operated unless the security system is disconnected from the external power source, comprising:

a microcomputer connected to said external power source;

storage means for storing a predetermined code;

input means for receiving a code;

comparator means coupled to said storage means and said input means for comparing said first predetermined code with said received code and for producing a first output signal upon determining that said first predetermined and received codes are identical; and



relay means coupled between said external power source and the protected device and connected to be actuated by said first output signal such that external power is provided to enable the protected device by selectively coupling said external power source to said device upon receipt of said first output signal;

whereby said received code need only be reentered if the coupling of said microcomputer to said external power source is interrupted.

4,604,709

CHANNEL COMMUNICATOR

Frederick T. Blount, Hopewell Junction; Robert S. Capowski, Verbank; Daniel F. Casper, Poughkeepsie; Lawrence R. DelSonno, Beacon; Robert F. Geller, Wappingers Falls, all of N.Y.; Joseph M. Kusmiss, El Paso, Tex., and Terrence K. Zimmerman, Red Hook, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 14, 1983, Ser. No. 465,952

Int. Cl.⁴ G06F *13/14, 13/38*

U.S. Cl. 364—900 **10 Claims**

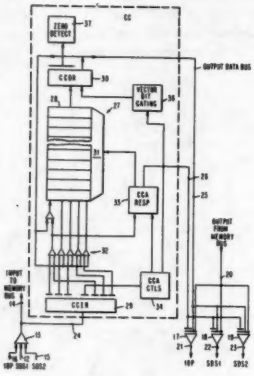
1. In a data processing system having a channel subsystem including (1) a plurality of channels for transmitting data between I/O devices and a central processor store, (2) a processor IOP for controlling certain operations of the channels, (3) and an input bus and an output bus interconnecting the channels and the IOP and the central processor store for these operations, a channel communicator for communications between the IOP and the channels, comprising,

a storage array having a multi-byte word location for each channel in the subsystem, an input register and an output register for the array, address means for accessing a word location in the array, and means for performing store and fetch operations,

means connecting said input register to receive a message from said input bus and connecting said output register to place a message on said output bus,

means in said channels and in said IOP for sending to said input register via said input bus a message containing a

channel ID identifying the channel that the message is addressed to or is from, a command to be executed by the channel communicator, and byte positions for data to be stored in said array on the execution of certain commands, means in said channel communicator for supplying address bits from the channel ID of a message to said address



means for accessing a word location holding an entry for the channel identified in the channel ID,

and means for executing commands for fetching data from a channel entry of the array, commands for storing data in a channel entry of the array and commands for both fetching and storing data in a channel entry of the array.

4,604,710

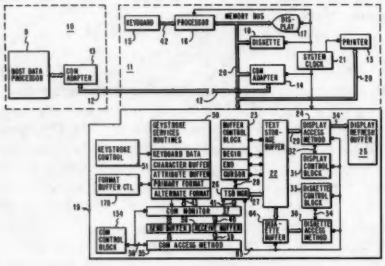
SYSTEM FOR CONVERTING DATA PROCESSING INFORMATION TO TEXT PROCESSING FORMAT AND VICE VERSA

Robert Amezcua, Austin; Silous F. Clements, Georgetown; John S. Coenen, Austin; Ralph H. DaFoe, Austin; Michael N. Day, Austin; Dennis M. Ross, Austin, and Richard O. Simpson, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 310,182, Oct. 9, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 588,404

Int. Cl.[4] G09G *1/10*; G06F *3/023*

U.S. Cl. 364—900 **7 Claims**



1. In an information processing system capable of conducting data processing operations wherein data information including one or more alphanumeric character codes and an attribute code is stored in a data processing field format and the data processing affects the substance of the data information and capable of conducting text processing operations wherein text information is stored in a text processing string format having strings of text codes intermixed with format codes and the text processing affects the arrangement of the text information, the improvement for converting data information in said data processing field format to text information in said text processing string format comprising:

means for storing data information in said data processing field format;

means connected to said means for storing for converting the stored data information in said data processing field format to text information in said text processing string format;

said means for converting the stored data information including means, connected to said means for storing, for scanning said data information after said data information has been stored;

means, connected to said means for scanning, for testing each of said codes of said stored data information to detect said attribute code; and

means, connected to said means for storing and said means for testing, for replacing said attribute code with a space code.

4,604,711

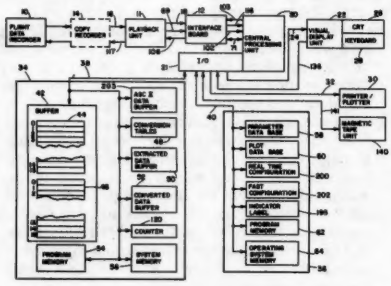
AIRCRAFT FLIGHT DATA DISPLAY SYSTEM

George Benn, Bellevue; Wendell Frost, Renton; Chris Knudsen, Federal Way, and David Nieuwsma, Renton, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 401,206, Jul. 23, 1982, abandoned. This application Sep. 23, 1982, Ser. No. 421,743

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—900 **50 Claims**



1. A system for displaying flight data from an aircraft flight data recorder, comprising:

a data storage unit;

input means, operatively connected to a source of the flight data from the flight data recorder and to said data storage unit, for reformatting and storing the flight data in said data storage unit, said input means including a sync word detector circuit for detecting sync words in the flight data;

processor means, operatively connected to said input means and said data storage unit, for converting selected portions of said reformatted flight data into engineering units and storing said converted flight data in said storage unit; and

a video display unit including a keyboard operatively connected to said processor effective to cause said processor means to select said portion of said reformatted flight data for conversion into engineering units and to display said converted flight data in the form of cockpit instruments.

4,604,712

APPARATUS FOR CONTROLLING REPRODUCTION OF TEXT CHARACTERS WHOSE FORM DEPENDS ON ADJACENCY OF OTHER CHARACTERS

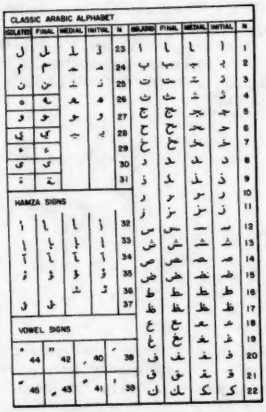
Hans Orrhammar, Grottaferrata, Italy, assignor to Agence Spatiale Europeenne, Paris, France

Filed Jan. 26, 1983, Ser. No. 461,032

Claims priority, application Belgium, Jan. 27, 1982, 01207149

Int. Cl.[4] G06F *3/14;* G06K *15/00;* B41J *5/00;* G09G *9/30*

U.S. Cl. 364—900 2 Claims



1. Digital apparatus for controlling the reproduction by a graphic device of characters forming the words of a text in a typescript including characters which have several possible graphic forms depending on the adjacency of other characters, the characters being received from an external source as sequences of character identification codes, said apparatus comprising:

a character generator including a character store having a base page section for storing codes identifying the base bodies of characters and at least one additional page section for storing codes identifying forms of the characters; and

a digital control device including:

first means for accepting and buffering the character identification codes from the external source,

second means for accepting the character identification codes from the external source to produce category signals for each character to be reproduced,

third means connected to receive the category signals from said second means for buffering the category signals of at least four successive characters,

fourth means responsive to the category signals buffered in said third means for producing a first control signal having a first state when the identification code of the character to be reproduced is stored in the base page section of the character store and a second state when the identification code of the character to be reproduced is stored in an additional page section of said character store, and also for producing at least one second control signal for the graphic device to enable the addition of supplementary signs to a character form read out from the character store, and

fifth means coupled to receive the character identification codes from the first means and said first control signal from the fourth means for producing a final character address code for the character store, thereby to select the character form to be reproduced.

4,604,713

TONE DETECTOR AND MULTIFREQUENCY RECEIVER USING SAID DETECTOR

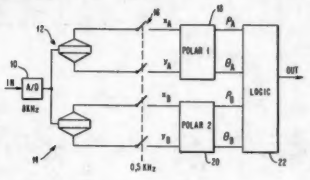
Dominique Godard, Le Rouret, and Emile Morlec, Saint-Paul, both of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,965

Claims priority, application European Pat. Off., Jun. 25, 1982, 82430017.2

Int. Cl.[4] G06F *15/31;* H04Q *1/45;* H04M *1/50*

U.S. Cl. 364—484 4 Claims



1. A method for detecting the reception of at least one pure tone frequency in a predetermined set of frequencies within a given frequency bandwidth, and for identifying said received tone frequency, said method including the steps of:

sampling and converting the received signal to a digital form;

bandpass filtering the converted digital signal within said predetermined bandwidth, and providing in-phase and quadrature components x,y of the filtered signal;

converting said x,y components into polar (phase, amplitude) components;

comparing successive values of the amplitude components over a given number of sampling periods for deriving an amplitude variation information therefrom;

computing successive phase variation values over equally spaced time intervals to derive a phase variation information therefrom;

detecting the reception of a pure tone by detecting that said amplitude and phase variations remain within predetermined respective limits; and,

identifying said detected pure tone by comparing said computed phase variation value with a set of predetermined frequency versus phase variation values for said predetermined set of frequency(ies).

4,604,714

STEAM OPTIMIZATION AND COGENERATION SYSTEM AND METHOD

Richard E. Putman, Penn Hills; Katherine A. Gundersen, Edgewood, and James C. Christenson, Glenshaw, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 8, 1983, Ser. No. 550,164

Int. Cl.[4] H02J *3/00*

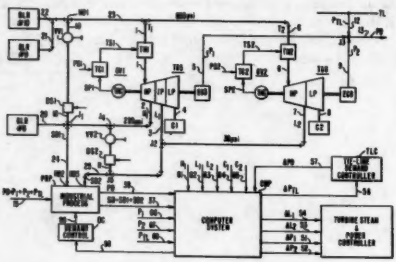
U.S. Cl. 364—494 3 Claims

1. In a cogeneration system including at least a first and a second turbogenerator unit, each supplied through throttle valve means with steam at a higher throttle pressure, for generating steam through extraction valve means at a lower extraction pressure and for exhausting steam to an associated condenser at a still lower exhaust pressure and under condenser constraints, while generating electrical power at an operating speed of the associated turbogenerator unit, said generated steam and electrical power being supplied to a plant together with electrical power derived from a tie-line, each of said turbogenerator units having a throttle flow input and a condenser flow output, at least one of said turbogenerator units having an extraction flow output, while generating output electrical power; the combination of:

first means responsive to a present steam demand of the plant for determining under said condenser constraints an opti-

mal steam flow output distribution between said exhaustion flow and condenser flow outputs from said turbogenerator units;

second means responsive to said optimal steam output distribution and to said plant power demand for providing a throttle flow input distribution for said turbogenerator units; and



control means responsive to said first and second means and operative on said extraction valve means and said throttle valve means for establishing said optimal steam flow output and throttle steam flow input distributions;

whereby said steam and power demands of the plant are optimally satisfied.

4,604,715

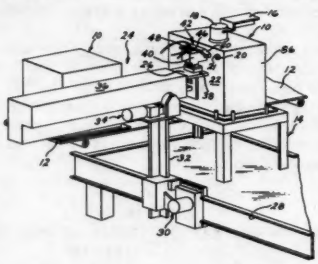
ROBOTIC INSPECTION SYSTEM

Roy T. Toutant, and Gerald J. Lozinski, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 19, 1984, Ser. No. 662,842

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—513 **8 Claims**



1. A method of inspecting and determining the status of a hole in the surface of a part comprising:

placing a robot at a stationary position, said robot being programmed by a controller and having a movable arm with a fiber optic scanner device capable of sensing a reflective surface,

placing the part to be inspected in a stationary fixture spaced from the robot,

moving the robot arm with the fiber optic scanner device to a point spaced from the part surface,

incrementally moving the robot arm with fiber optic scanner device closer to the part surface until light reflection from the part surface is detected by the fiber optic scanner device,

sending a signal to the robot controller upon detecting light reflection from the part surface to stop further incremental moving of the robot arm with optic scanner device closer to the part,

moving the robot arm with fiber optic scanner device in response to a signal from the robot controller parallel to the part surface to a predetermined position representing where the approximate hole location should be, and

determining by reflectivity value the presence or absence of the hole and sending a corresponding signal to the robot controller.

4,604,716

METHOD AND APPARATUS FOR CONTROLLING A ROBOT

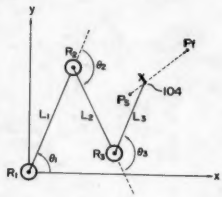
Kanji Kato, Tokorozawa; Junichi Higashino, Kokubunji, and Akisuke Naruse, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,090

Claims priority, application Japan, Dec. 10, 1982, 57-215425

Int. Cl.[4] G09C *00/00*; G05B *11/32, 19/10*

U.S. Cl. 364—513 **14 Claims**



1. A method for controlling a multi-joint robot having redundant operable joints comprising the steps of:

(a) calculating joint velocities for non-redundant joints based upon no movement of the redundant joints, for each of at least a portion of combinations formed by selecting different combinations of the non-redundant joints from all operable joints, the joint velocities for the combinations of non-redundant joints being capable of moving an end of the robot at a command velocity specified to the robot in a predetermined spatial coordinate, by an inverse-coordinate-transformation from said spatial coordinate to a joint coordinate inherent to the robot in response to current joint angles detected by encoders mounted on each joint of the robot, an averaging or nearly averaging the joint velocities to obtain an average joint velocity or nearly average joint velocity as a desired joint velocity for the joints; and

(b) supplying the desired joint velocity to a velocity control unit of the robot as a controlled variable.

4,604,717

METHOD AND APPARATUS FOR MEASURING THE TIME DELAY BETWEEN SIGNALS

Albert Kaplan, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 18, 1983, Ser. No. 467,645

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—569 **21 Claims**

1. A signal processing system for measuring the time delay between first and second signals, said system comprising:

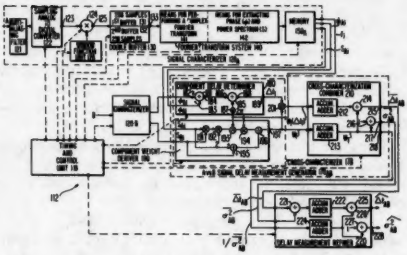
means for receiving said first and second signals; and

means for comparing said first signal to said second signal to determine the time delay of said second signal relative to said first signal comprising:

means responsive to said first and second signals for dissecting them individually into respective first and second sets of components, each component having a power level, and a primary frequency range, each component in said first set having a different primary frequency range and having a corresponding component in said second set having the same primary frequency range;

means responsive to said corresponding components of said first and second sets for generating a weighted time

delay of each component in said second set relative to its corresponding component in said first set; and



means for combining said weighted time delays to provide a measure of the time delay of said second signal relative to said first signal.

4,604,718

COMPUTER SIMULATION SYSTEM

Theodore A. Norman, Lindon, and Van B. Norman, Centerville, both of Utah, assignors to Simulated Designs, Ltd., Salt Lake City, Utah

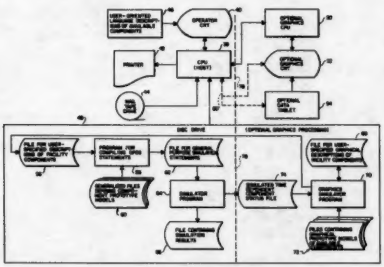
Filed Apr. 25, 1983, Ser. No. 488,095

Int. Cl.[4] G06F *15/16, 15/62*

U.S. Cl. 364—578 **14 Claims**

MICROFICHE APPENDIX INCLUDED

(5 Microfiche, 281 Pages)



1. A computer system for simulating a user-specified automated manufacturing and/or materials handling (AM/MH) facility which includes as part of the facility a plurality of different types of computer-controlled components, said computer-controlled components being listed in a catalog means containing user-oriented language descriptions adapted for input by a system user to a CPU, and said system comprising:

a central processing unit (CPU);

first means, electronically connected to said CPU, for inputting to said CPU said descriptions for said computer-controlled components which are to be simulated by said system;

second means, electronically connected to said CPU, for outputting information from said CPU; and

third means, electronically connected to said CPU, for controlling said CPU so as to generate at said second means a simulation which represents a working model of said user-specified AM/MH facility based on said component descriptions input to said CPU.

4,604,719

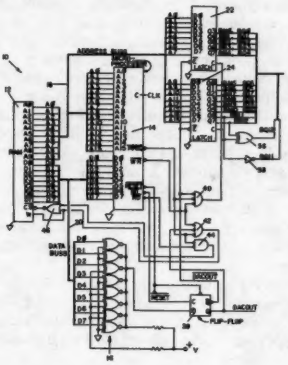
OSCILLATOR HAVING A SIXTEEN BIT SIGNAL GENERATION UTILIZING AN EIGHT BIT PROCESSOR

Gerald R. Stanley, Mishawaka, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Oct. 21, 1983, Ser. No. 544,280

Int. Cl.[4] G06F *1/02, 15/31; G03B 19/00*

U.S. Cl. 364—721 **5 Claims**



1. A signal generator comprising a processor having an eight bit data register and a sixteen bit address register, a memory device communicating with said processor through common address lines, digital to analog converter means, means for diverting signal data at said address register from said memory device to said converter means, said converter means for converting said signal data into an analog signal, means for converting said analog signal into a signal waveform.

4,604,720

INTERPOLATING FILTER ARRANGEMENT WITH NON-RATIONAL RATIO BETWEEN THE INPUT AND THE OUTPUT SAMPLING FREQUENCIES

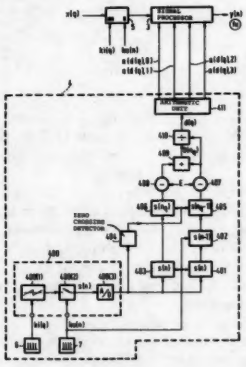
Eduard F. Stikvoort, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1984, Ser. No. 590,096

Claims priority, application Netherlands, Jan. 10, 1984, 8400073

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—724 **5 Claims**



1. An interpolating time-discrete filter arrangement having a

non-rational interpolation factor R for converting a time-discrete input signal formed by a sequence of input samples x(q), $q=\ldots -2, -1, 0, 1, 2, 3, \ldots$ with which an input sampling frequency f_i is associated into a time-discrete output signal formed by a sequence of output samples y(n), $n=\ldots -2, -1, 0, 1, 2, 3, \ldots$ and with which an output sampling frequency f_u is associated which is R-times higher than the input sampling frequency f_i, comprising:

(a) first means for producing input clock pulses ki(q) occurring at the said input sampling frequency f_i;

(b) second means for producing output clock pulses ku(q) occurring at the output sampling frequency f_u;

(c) a filter coefficients generator for producing a group of W filter coefficients, the generator comprising:

(c1) means to which the input clock pulses and the output clock pulses are applied and which in response to each input clock pulse ki(q) supplies a deviation component d(q) whose magnitude is proportional to the relationship between the time interval $T_{d(q)}$ located between that input clock pulse ki(q) and the immediately subsequent or the immediately preceding output clock pulse and the time interval $T_u=1/f_u$ between two consecutive output clock pulses;

(c2) means for generating the group of W filter coefficients in response to the deviation component d(q) supplied, the filter coefficient having number w being equal to d(d(q),w) and being defined by the expression

$$d(d(q),w)=h(d(q)T_u+wT_u)$$

$$w=0, 1, 2, \ldots W-1$$

wherein h(v) represents the impulse response of a FIR filter, v is a continuous variable in the interval $-\infty<v<\infty$

(d) a signal processing arrangement for generating the output samples y(n) by multiplying input samples by selected filter coefficients and adding together the products thus obtained.

4,604,721

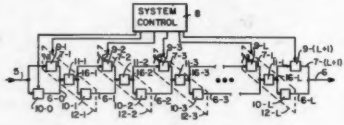
COMPUTER AND METHOD FOR HIGH SPEED PRIME FACTOR TRANSFORM

Joseph H. Gray, Berkeley, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 310,469, Oct. 13, 1981, abandoned. This application Feb. 27, 1985, Ser. No. 706,222

Int. Cl.[4] G06F *15/332*

U.S. Cl. 364—726 **15 Claims**



1. A computer for performing an N-length discrete Fourier transform of N initial data values, where the number N equals the product of a number L of mutually prime factors $N_1, N_2, \ldots N_i, N_i+1, \ldots N_L$, comprising:

(a) a set of one or more kernels;

(b) each kernel being adapted to perform a discrete Fourier transform characterized by a transform length equal to one or more of said prime factors N_i;

(c) wherein for each value of i in the range from 1 to L, said set of kernels includes a kernel adapted to perform a N_i-length transform;

(d) wherein each kernel includes:

first reorder means for receiving N input data values and reordering them into (N/N_i) groups, with each group consisting of N_i input data values x(n), n=0, 1, 2, $\ldots N_i-1$,

computational means for performing a sum and difference conjugate N_i-length discrete Fourier transform upon each of the (N/N_i) groups of N_i reordered input data values x(n), thereby producing (N/N_i) groups of N_i transformed data values X(k), for k=0, 1, 2, $\ldots N_i-1$, and

second reorder means for reordering the (N/N_i) groups of N_i transformed data values X(k) into N output data values, wherein N_i equals any of said transform lengths for which that kernel is adapted to perform a discrete Fourier transform;

(e) means for connecting said N initial data values to the kernel performing the N_1-length transform so that said initial data values are received as the N input data values of the N_1-length transform; and

(f) for each value of i in the range from 1 to L-1, means for connecting the N output data values produced by the kernel performing the N_i-length transform to the kernel performing the N_{i+1}-length transform so that said output data values are received as the N input data values of the N_{i+1}-length transform;

(g) whereby the N output data values produced by the kernel performing the N_L-length transform are the N-length discrete Fourier transform of the N initial data values.

4,604,722

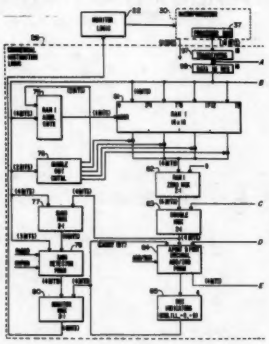
DECIMAL ARITHMETIC LOGIC UNIT FOR DOUBLING OR COMPLEMENTING DECIMAL OPERAND

Theodore R. Staplin, Jr., Chelmsford; John J. Bradley, Framingham, and Brian L. Stoffers, No. Billerica, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1983, Ser. No. 537,899

Int. Cl.[4] G06F *7/48*

U.S. Cl. 364—736 **3 Claims**



1. A decimal arithmetic logic unit comprising: an arithmetic processor having,

a first input port for receiving decimal operands,

a second input port for receiving decimal operands,

a carry-in port for receiving a carry out from a previous decimal arithmetic operation, and

an output port for providing a result decimal operand equal to the result of an arithmetic operation performed on decimal operands received at said first and said second input ports;

a first multiplexer having an output connected to said first input port, having a first input for receiving a first decimal operand, having a second input for receiving a second decimal operand, and having a select input for receiving a first select signal which determines if said first decimal operand or said second decimal operand is to be connected to the output of said first multiplexer, and

a second multiplexer having an output connected to said

second input port, having a first input for receiving said second decimal operand, having a second input for receiving a decimal zero operand, and having a select input for receiving a second select signal which determines if said second decimal operand or said decimal zero operand is to be connected to the output of said second multiplexer,

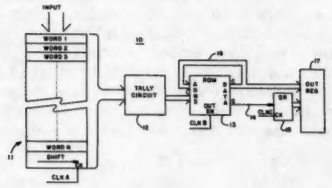
whereby said second operand may be applied via said first and said second multiplexers respectively to said first input port and to said second input port of said arithmetic processor so that said second operand may be added to itself when it is desired to convert said second operand in decimal format to binary format, and whereby either said first or said second decimal operands can be applied via said first multiplexer to said first input port of said arithmetic processor while said zero operand is connected via said second multiplexer to said second input port of said arithmetic processor so that they may be subtracted from said zero operand when it is desired to complement either said first or said second operand in decimal format.

4,604,723

BIT-SLICE ADDER CIRCUIT

James L. Burrows, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 17, 1983, Ser. No. 542,325
Int. Cl.[4] G05F 7/50
U.S. Cl. 364—786 **3 Claims**



1. A bit slice adder for forming a sum of a plurality of words each comprising a plurality of binary digits comprising:

(A) input means for iteratively receiving one binary digit slice from all of the words in parallel,

(B) tally means for iteratively receiving the binary digit slice from the input means and for transmitting an output signal having a value corresponding to the number of binary ones in the binary digit slices from the input means; and

(C) memory means connected to receive the output signal from the tally means for generating an output signal and a carry signal, in response to each output signal from the tally means for the particular binary digit slice, the memory means including a plurality of address inputs, the address inputs comprising high-order address inputs and low-order address inputs, the output signal from the tally means being coupled to the low-order address inputs and the carry signal from the memory means being coupled to the high-order address inputs, the output signal from the tally means and the carry signal from the memory means being coupled to the memory means address inputs as address signals, and the memory means output signal being representative of the sum of the number identified by the tally means and the carry signal generated in response to a previous iteration,

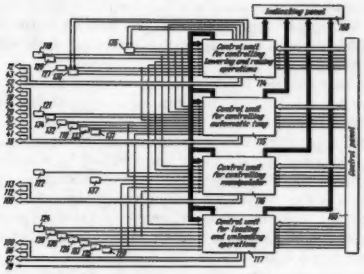
the memory means further comprising a plurality of storage locations each uniquely identified by the signals coupled to said address inputs, each storage location storing a value equal to the sum of the value corresponding to the low-order address inputs and the high-order address inputs which identify the location.

4,604,724

AUTOMATED APPARATUS FOR HANDLING ELONGATED WELL ELEMENTS SUCH AS PIPES

Albert S. Shaginian; Alexei G. Asan-Dzhalalov; Anatoly A. Pevnev; Alexandr P. Androsenko; Alexandr V. Suvorov; Boris V. Khalitov; Leonid N. Palkin, all of Gomel; Viktor V. Gnatchenko; Nikolai P. Makarov, both of Moscow; Valery A. Panteleev, Gomel; Nikolai I. Davidenko, Gomel; Stanislav K. Shpilevsky, Gomel; Alexandr S. Tikhonenko, Gomel, and Anatoly G. Romanovsky, Gomel, all of U.S.S.R., assignors to Gomelskoe Spetsialnoe Konstruktorsko-Tekhnologicheskoe Bjuro Seismicheskoi Tekhniki S Opytnym Proizvodstvom, Gomel, U.S.S.R.

Continuation of Ser. No. 468,844, Feb. 22, 1983, abandoned.
This application Oct. 4, 1985, Ser. No. 783,277
Int. Cl.[4] G06F 15/20
U.S. Cl. 364—478 **2 Claims**


Indicating panel
Control unit for controlling lowering and raising operations
Control unit for controlling automatic tong
Control unit for controlling manipulator
Control unit for locking and unlocking operations
Control panel

1. An automated apparatus for handling elongated well elements such as pipes, made up into a pipe string by means of screw joints, which comprises:

a first base;

a derrick mounted on said first base;

elevator means for suspending a pipe string mounted on said derrick and for vertical movement, said elevator means including gripping means and drive means for closing and opening said gripping means;

driving means to move said elevator means vertically for suspending a pipe string and mounted on said first base;

suspending means for suspending a pipe string immovably mounted above a well head and below said elevator means, said suspending means including gripping means and drive means for closing and opening said gripping means;

an automated tong for screwing and unscrewing a pipe string, said tong being mounted upon said first base between said elevator means and suspending means and for transverse movement relative to a pipe string and including drive means for rotating a pipe element;

a second base mounted adjacent but spaced from said first base;

manipulator means mounted on said second base for movement so that a pipe element clamped thereby can be aligned with a pipe string, said manipulator means including gripping means mounted for longitudinal movement relative to said manipulator means, drive means for closing and opening said gripping means, and drive means for longitudinal movement of said gripping means relative to said manipulator means;

a rack for storing string elements in a horizontal position and mounted on said second base, said rack including:

substantially vertical columns mounted on said second base;

shelves mounted on said columns and vertically spaced above one another;

drive means for moving said shelves;

transfer means for transferring a string element from said

rack into said manipulator means and back, said transfer means mounted on said second base and comprising:

at least one boom mounted on said second base for pivoting movement in a vertical plane;

gripping means mounted on said boom for holding a string element;

drive means for closing said gripping means;

drive means to pivotally move said boom;

control means including:

a plurality of electronically controlled actuator means for actuating said transfer means, said drive means to pivotally move said boom, and said drive means for closing and opening said gripping means of said manipulator means, of said automatic tong, of said elevator means and suspending means for suspending a pipe string, and of said transfer means for transferring well elements;

position sensing means mounted on said transfer means for sensing the position of said boom and for providing one of two signals: "approached" corresponding to the position of said boom as it approaches the manipulator means or "withdrawn" corresponding to stopping said boom in a preset position for transferring a string element to said manipulator means and gripping a string element by said manipulator means;

position sensing means mounted on said shelves for sensing positions of said shelves of said rack and for providing one of two signals: "approached" corresponding to the position of the shelves for loading string elements, or "withdrawn" corresponding to moving said shelves away from said loading position and to stopping said shelves in a preset position;

control means comprising at least one programmed logical control means connected with said actuating means of said plurality of electrically controlled actuating means and wherein said programmed logical control means further comprises:

an instruction coding means for specifying a sequence of instructions to be sent to respective control means in accordance with a preset sequence of operation;

a timer for generating a signal at the end of a time preset by a code of instructions produced by said instruction coding means;

a recycle counter electrically connected with said timer of said programmed logical control means to generate a signal upon receiving an output signal from said programmed logical control means indicative of the termination of a preset time from the moment of the generation of an instruction for switching on of said drive means for rotating said automatic tong;

a control signal conditioner electrically connected with said timer, with said instruction coding means of said programmed logical control means, and with said recycle counter to generate and send to said programmed logical control means, in an amount preset by said recycle counter, instructions for reversing and for restarting said instruction coding means in the original counting direction;

a string element counter electrically connected with said instruction coding means of said programmed logical control means for generating a signal at the moment when the number of string elements taken from a desired shelf of said rack or stored on said shelf reaches a preset amount defined by the capacity of said shelf; and

counting means for counting said shelves of said rack and electrically connected with said counter for string elements and for supplying to a respective corresponding drive means an instruction to move a required one of said shelves into the position for loading and to withdraw it from said position for loading, and for switching off said programmed logical control means at the moment when all said shelves of said rack are fully loaded and at the moment when all said shelves of said rack are empty.

4,604,725

ROTARY APPARATUS HAVING CODE TRACK WITH PSEUDO-RANDOM BINARY DIGIT SEQUENCE FOR INDICATING ROTATIONAL POSITION

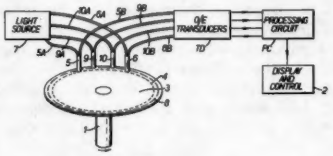
George G. Davies; Stuart M. McGlade, and Peter L. Dunn, all of Chelmsford, England, assignors to The Marconi Company Limited, Stanmore, England

Filed May 17, 1983, Ser. No. 495,389

Claims priority, application United Kingdom, May 18, 1982, 8214452

Int. Cl.[4] G06F *15/20, 7/58*

U.S. Cl. 364—900 **5 Claims**



1. Apparatus for indicating the position of a rotatable member, comprising:

a rotatable member;

a code track disposed on said rotatable member and defining a pseudo-random sequence of binary digits consisting of ones and noughts and extending continuously around said rotatable member, the pseudo-random sequence including a given number of n consecutive noughts, and the digits of the sequence being arranged so that each group of n adjacent digits is different from each other group of n adjacent digits in the pseudo-random sequence; and

reading means operatively positioned relative to said code track for reading n consecutive digits of the pseudo-random sequence, each n consecutive digits of the pseudo-random sequence defining a position of said member.

4,604,726

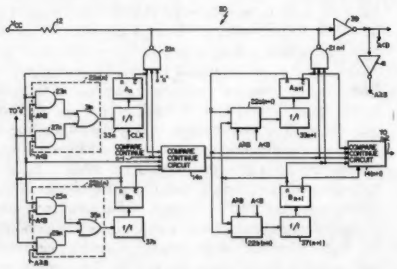
SORTING APPARATUS

John Terzian, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 18, 1983, Ser. No. 485,809

Int. Cl.[4] G06F *7/24*

U.S. Cl. 364—900 **3 Claims**



1. In a digital computer wherein a randomly arranged set of n digital numbers is to be converted to a set of n digital numbers, where n is greater than two, in and ordered sequence after $(2n-1)$ clock pulses, the improvement comprising:

(a) n registers for storing n digital numbers, the digital numbers initially stored in such registers being randomly arranged;

(b) comparator means, switchably disposed between adjacent first pairs of registers upon the occurrence of odd

numbered ones of the (2n−1) clock pulses, for testing the digital numbers initially stored in each such first pair of registers to determine whether or not the digital numbers stored in each first pair are in the ordered sequence and to produce first control signals indicative of the result of comparison of the digital numbers;

(c) transfer means, responsive to first control signals indicating that the digital numbers stored in any first pair of registers are not in the ordered sequence, for then interchanging the digital numbers in any such first pair; and

(d) means, responsive upon occurrence of even numbered ones of the (2n−1) clock pulses, for switching each comparator means to a second pair of adjacent registers, each one of such second pair including one of the registers in a corresponding first pair and not the first or the last ones of the registers, to produce second control signals for the transfer means whereby, after the occurrence of, at the most, (2n−1) clock pulses, the digital numbers stored in the registers are in the ordered sequence.

4,604,727

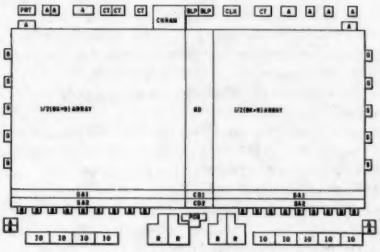
MEMORY WITH CONFIGURATION RAM

Ashwin H. Shah, Dallas; Pallab K. Chatterjee, Richardson; James D. Gallia, and Shivaling S. Mahant-Shetti, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1983, Ser. No. 528,303

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189 **7 Claims**



1. An integrated circuit memory comprising:

(a) an array of memory cells;

(b) output means for reading out one or more selected cells from said array of memory cells;

(c) programmable peripheral circuits, said programmable peripheral circuits comprising means for controlling the operation of said output means to effect a predetermined memory control logic function; and

(d) a configuration RAM connected to at least one of said programmable peripheral circuits for controlling the operations thereof;

(e) said configuration RAM comprising both constant-value output means connected to selected ones of said programmable peripheral circuits and differential analog output means.

4,604,728

SEMICONDUCTOR MEMORY DEVICE

Yoshinori Okajima, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 1, 1983, Ser. No. 510,349

Claims priority, application Japan, Jul. 2, 1982, 57-116055; Dec. 29, 1982, 57-233779

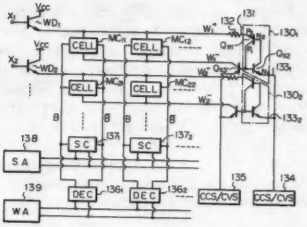
Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189 **15 Claims**

1. A semiconductor memory device including pairs of word lines, and a first constant current source or a first constant voltage source, comprising:

a plurality of static-type memory cells, respectively connected to the pairs of word lines, each of the pairs of word lines including a word line having a high potential and a word line having a low potential; and

a plurality of word-line discharging circuits, each of said



word line discharging circuits being connected to a respective one of the pairs of word lines, and comprising:

a voltage level shifter operatively connected to the word lines having the high potential; and

a thyristor having an anode operatively connected to said voltage level shifter and having a cathode operatively connected to the first constant-current source or the first constant-voltage source.

4,604,729

STATIC-TYPE SEMICONDUCTOR MEMORY DEVICE

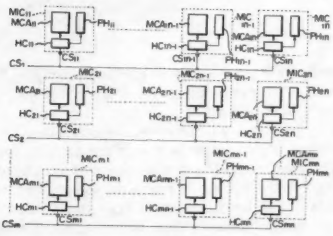
Masayoshi Kimoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 5, 1983, Ser. No. 482,301

Claims priority, application Japan, Apr. 12, 1982, 57-59763

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—190 **17 Claims**



1. A static-type semiconductor memory device comprising:

a plurality of memory blocks, arranged in rows and columns to form a matrix, having selected and unselected states, any one row of the memory blocks being selected to carry out a reading or writing operation in the selected memory blocks, each of said memory blocks comprising:

a memory cell array including memory cells;

a peripheral circuit operatively connected to said memory cell array, said peripheral circuit comprising:

a holding current supplying circuit, operatively connected to said memory cell array, for supplying a holding current for holding data stored in said memory cells;

bit lines operatively connected to said memory cells;

a first current-source circuit, operatively connected to said bit lines, for supplying currents to said bit lines;

a sense amplifier circuit, operatively connected to said bit lines, for detecting potential differences between said bit lines; and

a second current-source circuit, operatively connected to said sense amplifier circuit, for supplying currents, other than those supplied by said first current-source circuit, to said sense amplifier circuit; and

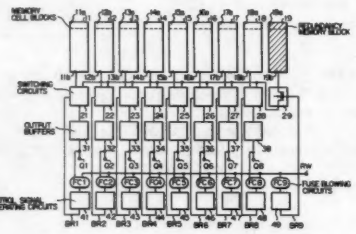
a holding-current controlling circuit, operatively connected to said peripheral circuit and said holding-current supplying circuit, for controlling said holding-current supplying circuit such that the holding-current supplied to an unselected-state memory block is greater than the holding-current supplied to a selected-state memory block, and such that the currents supplied from said first current-source circuit to said bit lines and the currents supplied from said second current-source circuit to said sense amplifier, assoicated with an unselected-state memory block, are smaller than the currents supplied from said first current-source circuit to said bit lines and the currents supplied from said second current-source circuit to said sense amplifier, associated with the selected-state memory block.

4,604,730

SEMICONDUCTOR MEMORY DEVICE

Masanobu Yoshida, Kawaguchi, and Kiyoshi Itano, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 8, 1984, Ser. No. 578,000
Claims priority, application Japan, Feb. 8, 1983, 58-18027
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—200 **11 Claims**



1. A semiconductor memory device comprising:

a plurality of output terminals for respectively outputting a plurality of output bit data;

a plurality of memory cell blocks, respectively, operatively connected to said output terminals and each having a first specific area for storing first predetermined data and each having a first memory data area for storing first data;

a redundancy memory cell block, operatively connected to said plurality of memory cells, for replacing a faulty memory cell block among said plurality of memory cell blocks, having a second specific area for storing second predetermined data comprising a plurality of bits, and having a second memory data area for storing second data, said first predetermined data being equal to a divided one of said second predetermined data in a one to one correspondence, said second specific area in said redundancy memory cell block being divided into a plurality of sub-blocks, each of said sub-blocks storing a divided one of said second predetermined data, and each of said second sub-blocks corresponding to one of said plurality of memory cell blocks; and

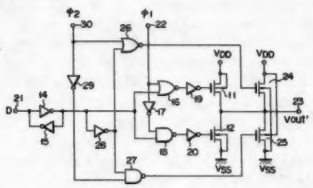
means, operatively connected to said plurality of memory cell blocks, for selectively reading, when said first memory data area in one of said memory cell blocks is replaced by said second memory data areas in said redundancy memory cell block, a divided one of said second predetermined data corresponding to said first predetermined data stored in said one of said memory cell blocks to be replaced by said redundancy memory cell block.

4,604,731

OUTPUT CIRCUIT FOR A SEMICONDUCTOR MEMORY DEVICE

Satoshi Konishi, Tokyo, Japan, assignor to Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 2, 1983, Ser. No. 528,790
Claims priority, application Japan, Sep. 3, 1982, 57-153412
Int. Cl.[4] G11C *7/00*; H03K *19/092*
U.S. Cl. 365—203 **17 Claims**



1. An output circuit for a semiconductor memory device, comprising:

first and second potential supply terminals;

a data signal input terminal for receiving a data signal read out of a memory cell;

a control signal input terminal for receiving a control signal;

a signal output terminal;

a first transistor connected between the first potential supply terminal and the signal output terminal;

a second transistor connected between the second potential supply terminal and the signal output terminal;

a preset circuit including of a third transistor connected between the signal output terminal and the first potential supply terminal and a fourth transistor connected between the signal output terminal and the second potential supply terminal;

a control circuit for controlling the first and second transistors according to the data signal input to the data signal input terminal and the control signal input to the control signal input terminal; and

preset circuit control means for presetting the third and fourth transistors during a preparative period for read preceding the data readout from the memory cell, to set a potential on the signal output terminal to a potential between a potential of the first potential supply source and that of the second potential supply source.

4,604,732

POWER SUPPLY DEPENDENT VOLTAGE REFERENCE CIRCUIT

Hiep van Tran, Carrollton, Tex., assignor to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed May 29, 1984, Ser. No. 614,619
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—207 **8 Claims**

1. A circuit for sensing a voltage state comprising:

a conditioning circuit responsive to an applied input data voltage for generating a conditioned data voltage on a conditioned input node;

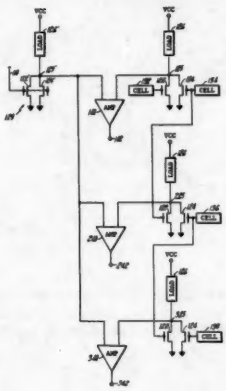
a voltage reference circuit for generating a reference voltage on a reference node; and

sensing means for comparing said conditioned data voltage and said reference voltage;

in which said voltage reference circuit comprises means for supplying current to a reference node and first and second reference transistors connected in parallel between said reference node and a second node, each of which first and second reference transistors has a gate controlled by first and second dummy memory cells having predetermined stored data, whereby the voltage of said reference node and the impedance of said first and second reference tran-

sistors between said reference node and said second node is dependent on said stored data;

in which said conditioning circuit comprises means for supplying current to a conditioned input node and a pair of corresponding first and second transistors, each of which is matched to one of said first and second reference transis-



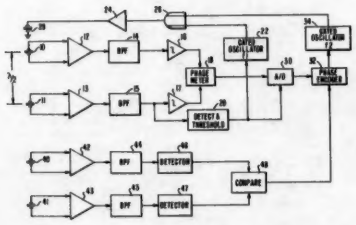
tors, which pair of corresponding transistors are connected in parallel between said conditioned input node and ground and both of which corresponding transistors have their gates connected to an input node, whereby an applied input data voltage produces a corresponding conditioned data voltage on said conditoned input node.

4,604,733

APPARATUS FOR DETERMINING RANGE AND BEARING

Billy F. Brown, Arnold, and Kenneth J. Petrosky, Glen Burnie, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 3, 1984, Ser. No. 567,592
Int. Cl.[4] G01S *15/42, 15/74*
U.S. Cl. 367—2 **13 Claims**



1. Apparatus for determination of range and bearing, comprising:

(a) first means, for operation at a first location, for transmitting an acoustic interrogating signal;

(b) second means, for operation at a second location, responsive to said interrogating signal to, in turn,

(i) transmit a first response signal upon receipt of said interrogating signal, and

(ii) transmit a second response signal at a time after transmission of said first response signal, where said time is a function of the bearing between said first and second locations;

(c)

(i) said first means including means for generating range and bearing information in response to receipt of said first and second response signals;

(d) said second means including

(i) first and second hydrophones spaced apart by a distance of approximately $\lambda/2$, where λ is the wavelength of said interrogating signal, and each operable to provide an output signal in response to impingement of said interrogating signal;

(ii) a phase meter responsive to said hydrophone output signals and operable to provide an output signal indicative of the phase difference between them, said phase difference being related to the direction of impingement of said interrogating signal;

(iii) means for translating said phase meter output signal to a corresponding time delay;

(iv) means for generating said first response signal in response to said impingement of said interrogating signal; and

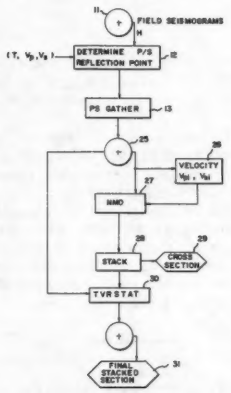
(v) means for generating said second response signal after said time delay.

4,604,734

SEISMIC EXPLORATION IN AREAS WHERE P WAVES ARE CONVERTED TO S WAVES

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 220,889, Dec. 29, 1980, abandoned.
This application Jun. 6, 1983, Ser. No. 501,338
Int. Cl.[4] G01V *1/34, 1/28*
U.S. Cl. 367—63 **4 Claims**



1. A method of enhancing seismic sections of areas containing subsurface formations which generate shear wave reflections from longitudinal wave excitation, comprising:

generating seismic energy and detecting reflections of said energy with a plurality of offsets between the source and detector to produce a plurality of field seismograms, which include reflections from asymmetrical, common reflection points where there is a conversion between longitudinal and shear waves;

determining the velocity of said energy in the earth formations to said asymmetrical common reflection points;

determining the asymetrical reflection point for the field seismograms from the velocity determined in the preceding step and from the course to detector offset for the seismogram;

gathering said field seisomograms into sets having reflections from said asymmetrical common reflection points;

determining the velocity of said energy in said earth formations from said gathered sets of field seismograms;

normal moveout correcting said gathered sets of field seismograms using the velocity determinations from said preceeding steps.

enhancing said gathered sets of seismograms to correct for non-surface consistent static time shifts; and

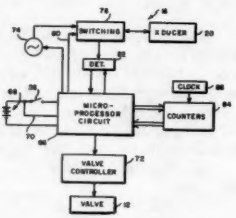
stacking said sets to produce a seismic section which emphasizes the reflections from said asymmetrical reflection points at which there is a conversion between longitudinal waves and shear waves.

4,604,735

ULTRASONIC MOTION DETECTION SYSTEM

Natan E. Parsons, Cambridge, Mass., assignor to Recurrent Solutions, Inc., Cambridge, Mass.

Division of Ser. No. 535,213, Sep. 23, 1983, Pat. No. 4,520,516.
This application Jan. 24, 1985, Ser. No. 694,611
The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.
Int. Cl.[4] G08B *21/00*
U.S. Cl. 367—93 **3 Claims**



1. An ultrasonic motion-detection system comprising:

A. ultrasonic means for transmitting ultrasound into a target region and detecting ultrasound reflected from objects in the target region;

B. a control circuit, electrically connected for application of drive signals to and reception of echo signals from the ultrasound means, for operating the ultrasound means to transmit ultrasound into the target region, measuring the time between ultrasound transmission and the reception of echo signals, comparing the measurement for each transmission with the measurement of the previous transmission, and providing an indication of object motion if successive measurements of time between ultrasound transmission and the reception of ultrasound echo signals differ.

4,604,736

DIGITAL DEVICE FOR THE FORMATION OF SONAR CHANNELS

Alain Demeure, Meudon, France, assignor to Thomson CSF, Paris, France

Filed Oct. 21, 1983, Ser. No. 544,412
Claims priority, application France, Oct. 22, 1982, 82 17742
Int. Cl.[4] G01S *3/82*
U.S. Cl. 367—123 **15 Claims**

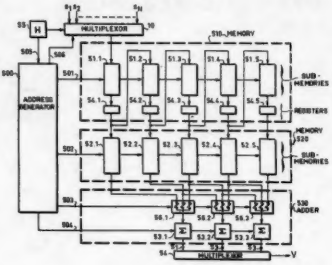
1. A digital device for forming of spatial channels for a sonar having an acoustic transducer array comprising N sensor which deliver N sensor signals, said device comprising:

means for sampling and time multiplexing in series the N sensor signals;

storage means, having a plurality of memory blocks, for sequentially storing the samples of the N sensor signals;

addressing means for supplying a series of reading addresses to the memory blocks, all the memory blocks receiving the same address at the same time;

summing means, coupled to said memory blocks, for calculating in parallel, Q values for each spatial channel, each value being calculated as a function of a series of samples of the N sensor signals, each series of samples being read respectively in the memory blocks at the series of addresses supplied by the addressing means; and



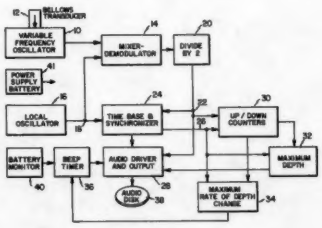
means for storing the Q values calculated in parallel for each channel and restoring them in a series constituting signal values of a spatial channel of the sonar.

4,604,737

ELECTRONIC DIVING APPARATUS

Gordon B. Hoffman, Colorado Springs, Colo., assignor to Hoffman & Goode, Richardson, Tex.

Filed Jul. 15, 1983, Ser. No. 514,317
Int. Cl.[4] G06F *15/42*; H04B *11/00*
U.S. Cl. 367—134 **14 Claims**



1. An electronic diving apparatus for producing indication sounds to assist a diver carrying the apparatus, comprising:

means for sensing ambient pressure in a body of water;

means responsive to said means for sensing for generating a depth signal having a frequency related to said ambient pressure;

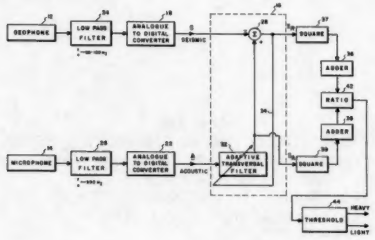
timing means for gating said depth signal to produce periodic audio signal pulses separated by intervals of silence having a greater time duration than said pulses; and

transducer means for receiving said gated depth signal and producing a corresponding sound in said body of water for indicating the depth of said apparatus within said body of water.

4,604,738
METHOD AND APPARATUS FOR CLASSIFICATION OF A MOVING TERRESTRIAL VEHICLE AS LIGHT OR HEAVY

Raj Aggarwal, Wayzata, and Bindinganavle R. Suresh, New Brighton, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 22, 1982, Ser. No. 350,926
Int. Cl.⁴ G01V *1/28*
U.S. Cl. 367—135 **2 Claims**



2. A system for classifying a terrestrial moving object as either heavy or light, comprising in combination:

means for detecting a seismic signal generated by said object;

means for detecting an acoustic signal generated by said object;

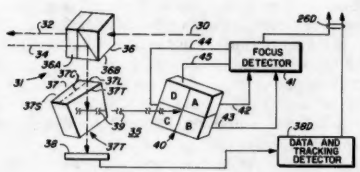
means responsive to said seismic signal and said acoustic signal for separating said seismic signal into a signal component which is a function of the Rayleigh component of the seismic signal and a signal component which is a function of the acoustically coupled component of the seismic signal; and

means responsive to the relative magnitudes of said Rayleigh and acoustically coupled seismic component signals for classifying said terrestrial moving object as either heavy or relatively light.

4,604,739
OPTICAL FOCUS DETECTION EMPLOYING ROTATED INTERFERENCE PATTERNS

Donald K. Cohen, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,863
Int. Cl.⁴ G11B *7/09*
U.S. Cl. 369—45 **10 Claims**



8. An optical device having a collimated light source for emitting a beam of light; a member capable of reflecting the emitted beam of light but with predetermined focus indicating changes; a lense system for transmitting said emitted beam of light to said member and for transmitting said reflected beam of light;

the improvement including an improved focus detector comprising:

a beam splitter disposed in said lense system for passing said emitted light and blocking said reflected beam of light from passing but deflecting said reflected beam of light in a direction away from said lense system;

a pattern generating optical member disposed adjacent to said beam splitter for intercepting said deflected light beam to rotatably generate a light interference pattern having a rotational orientation in accordance with and indicating said predetermined focus indicating changes;

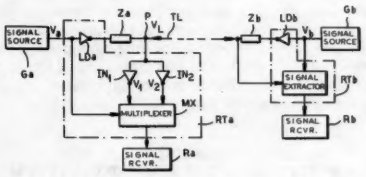
a quadrant detector disposed adjacent to pattern generating optical member for intercepting said light interference patterns, quadrant detector having four quadrant light detectors disposed in a rectangular array so as to intercept said quadrant detectors being arranged into two pairs of diagonal detectors; and

circuit means connected to said four quadrant detectors for effectively additively combining signals from the quadrant detectors in said pairs of diagonal detectors and subtractively combining the sums for indicating focus when the sums are equal and nonfocus when the sums are not equal.

4,604,740
DIGITAL TRANSCEIVER FOR FULL-DUPLEX TRANSMISSION OF BINARY SIGNALS OVER A COMMON LINE

Marco Gandini, and Mario Sartori, both of Turin, Italy, assignors to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Mar. 2, 1984, Ser. No. 585,567
Claims priority, application Italy, Mar. 4, 1983, 67245 A/83
Int. Cl.⁴ H04L *5/14*
U.S. Cl. 370—27 **8 Claims**



1. A full-digital circuit arrangement connected with a local source of outgoing binary signals for the detection of incoming binary signals from a remote source communicating with said local source by way of a single tapped transmission line, said binary signals alternating between a low voltage level and a high voltage level, said circuit arrangement comprising:

a line driver and a terminating impedance connected in series between the local source and the tap of the transmission line, the impedance reducing the voltage of the signal of the line driver, whereby the voltage at the tap is proportional to the sum of the voltages of concurrent incoming and outgoing signals;

first and second logic-element voltage sensors with respective inputs connected in parallel to the tap of said transmission line, said first voltage sensor having a threshold lying at a lower intermediate level between said low voltage level and a median level of said high and low voltage levels, said second voltage sensor having a respective second threshold lying at a higher intermediate level between said median and high voltage levels;

a local signal receiver having an input; and

switch means controlled by said local source for selectively connecting the input of the local signal receiver only to the first voltage sensor when the signal of the local source is at the low voltage level and for connecting the input of the local signal receiver only to the second voltage sensor when the signal of the local source is at the high voltage level and for thereby supplying said signal receiver at all instants with an output signal from the respective voltage

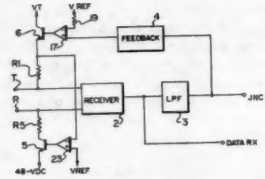
sensor varying in conformity with the voltage level of an incoming binary signal.

4,604,741

VOICE AND DATA INTERFACE CIRCUIT

John A. Barsellotti, Kanata, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed May 17, 1984, Ser. No. 611,515
Claims priority, application Canada, Sep. 30, 1983, 438,169
Int. Cl.[4] H04J *1/12*; H03H *7/38*
U.S. Cl. 370—69.1 **16 Claims**



1. An interface circuit comprising:

(a) means for receiving a first and a second signal having two different frequencies from a line, the line having a first nominal line impedance to the first signal and a second nominal line impedance to the second signal which is less than the first nominal line impedance, said receiving means having an input impedance intermediate said first and second line impedances, and

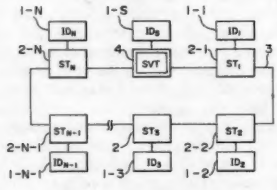
(b) means for applying a representation of the first signal in aiding phase with the first signal and a representation of the second signal in opposing phase to the second signal, to the line whereby the input impedance is raised to at least approximately match the first nominal line impedance with respect to the first signal and lowered to at least approximately match the second nominal line impedance with respect to the second signal.

4,604,742

LOOP TYPE DATA TRANSMISSION SYSTEM

Takuji Hamada; Masahiro Takahashi, both of Hitachi, and Sadao Mizokawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,165
Claims priority, application Japan, Apr. 11, 1983, 58-62295
Int. Cl.[4] H04J *3/16*
U.S. Cl. 370—89 **4 Claims**



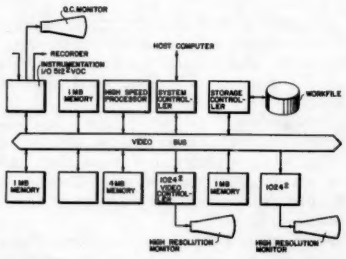
1. A loop type transmission system comprising a plurality of data transmission stations connected in cascade along a loop transmission line in which any station that has completed a transmission of data sends out token information to be used for determining the next station to perform transmission of its data, said token information being either a free token which represents that the loop transmission line is in a condition for any station to assume control of the loop transmission line to transmit data thereon or a busy token which represents that the loop transmission line is in a condition in which a station is currently transmitting data thereon, any station having a transmission request to transmit data on the loop transmission line sequentially detecting a free token on the loop transmission line, transmitting a busy token onto the transmission line, transmitting its data onto the loop transmission line, and transmitting a free token onto the loop transmission line, said station which transmits the data onto the loop transmission line subsequent to transmission of the data changing from a data transmitting state into a state of repeating data and tokens received from other stations upon detection of a busy token.

4,604,743

BUS STRUCTURE FOR AN IMAGE PROCESSOR

Radu Alexandru, Cheshire, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Nov. 21, 1984, Ser. No. 673,960
Int. Cl.[4] H04J *3/02, 3/16, 3/24*
U.S. Cl. 370—85 **8 Claims**



1. An image processing system, capable of sustaining N simultaneous processes, comprising:

a plurality of data acquisition, data processing, storage, and/or display devices;

a synchronous video bus interconnecting all of said devices for communicating digital image information therebetween at video data rates;

a low speed bus interconnecting said devices for communicating control information therebetween;

said video bus comprising a time-multiplexed address selection bus, a timing and synchronization bus, and a plurality of N dynamically allocatable data sub-buses;

said address selection bus and each of said data sub-buses comprising a plurality of parallel data lines;

system clock means for producing a periodic signal on the clock bus which defines sequential time slots;

packet clock means for producing a periodic signal on the clock bus which defines sequential packet slots, each of said packet slots comprising at least N time slots and being synchronized therewith;

each of said devices comprising means for transmitting and/or receiving a packet of N serial words of data on each of one or more allocated sub-buses during each packet slot and in synchronization with said time slots;

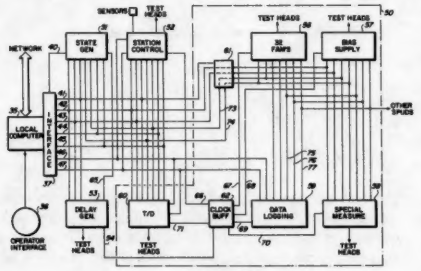
each of said devices further comprising means for transmitting and/or receiving a single word of address information during a single allocated time slot in each packet which time slot is uniquely allocated with the data sub-bus allocated to the device;

whereby said sub-buses are spatially multiplexed among said processes and said address bus is time multiplexed among said processes.

4,604,744
AUTOMATED CIRCUIT TESTER

Hugh Littlebury, Tempe, and Mavin Swapp, Mesa, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 1, 1984, Ser. No. 656,812
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—20 **23 Claims**



1. An apparatus for testing at least one electronic device having a predetermined number of pins comprising:

a state memory having a plurality of memory locations, each of said locations containing a frame comprising a number of elements greater than said predetermined number of pins;

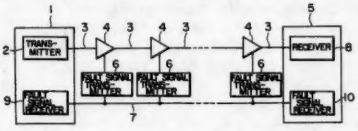
a number of force and measure units coupled to said state memory and to said pins, said number of force and measure units being greater than or equal to said predetermined number of pins, each of said force and measure units being responsive to a predetermined element of each frame in said state memory; and

state generator means for providing addresses to said state memory, said state generator means being responsive to a test program stored in at least one element of each frame of said state memory.

4,604,745
METHOD OF SEARCHING FAULT LOCATIONS IN DIGITAL TRANSMISSION LINE

Yoshitaka Takasaki, Tokorozawa; Kiichi Yamashita, Kanagawa, and Yasushi Takahashi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 578,791
Claims priority, application Japan, Mar. 11, 1983, 58-40455; Dec. 28, 1983, 58-246931
Int. Cl.[4] H04B *3/46*
U.S. Cl. 371—22 **29 Claims**



1. A method of searching fault locations in a transmission system comprising a transmitting terminal having a transmitter for transmitting a digital signal; a receiving terminal having a receiver for receiving the digital signal; a plurality of repeaters which are placed between the transmitting and receiving terminals, and each of which receives and amplifies the digital signal from a preceding repeater section and delivers it to a subsequent repeater section; and a plurality of transmission lines for connection of the first repeater to the transmitter, for connection of the repeaters with each other, and for connection of the final repeater with the receiver, respectively; said method comprising the steps of:

coding an original signal to be transmitted in terms of an error detecting code at the transmitting terminal to send it out from the transmitter;

detecting an error or a received signal using said error detecting code at each repeater thereby to measure the error rate of one repeater section corresponding to each repeater;

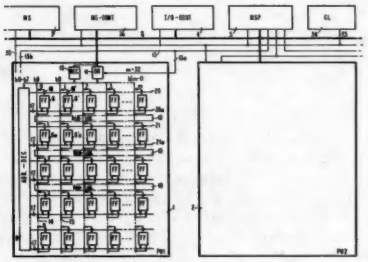
recoding a decoded received signal using said error detecting code employed to detect the error, and delivering it to a subsequent repeater section; and

transmitting signals each of which represents said error rate at each repeater section measured at each repeater, to the transmitting terminal or receiving terminal.

4,604,746
TESTING AND DIAGNOSTIC DEVICE FOR DIGITAL COMPUTERS

Arnold Blum, Gechingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 19, 1984, Ser. No. 602,108
Claims priority, application European Pat. Off., May 25, 1983, 83105172.7
Int. Cl.[4] G06F *11/22*
U.S. Cl. 371—25 **8 Claims**



1. A data-processing system comprising:

a central processor having random logic networks interconnected by storage elements, said logic networks and said storage elements together performing data-processing operations in a normal mode;

a main storage;

an input/output control;

a service processor for generating test patterns and test addresses and for receiving and analyzing test results in a test mode;

a high-speed system bus coupled to said central processor, to said main storage, to said input/output control, and to said service processor, said but being adapted to carry system data and addresses among said central processor, said main storage, and said input/output control in said normal mode, and to carry said test patterns, addresses, and results between said central processor and said service in said test mode;

an address decoder located in said central processor and operative in said test mode for addressing particular ones of said storage elements in accordance with said test addresses from said system bus;

receiver means located in said central processor and operative in said test mode for writing said test patterns from said system bus into said particular storage elements addressed by said address decoder;

driver means located in said central processor and operative in said test mode for reading the contents of said particular

storage elements addressed by said address decoder to said system bus as said test results.

4,604,747

ERROR CORRECTING AND CONTROLLING SYSTEM

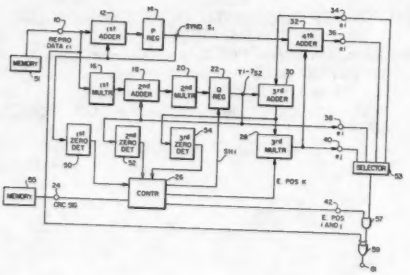
Ken Onishi, Kyoto; Masayuki Ishida, Nagaokakyo; Masakazu Shirozu, Osaka; Toshikatsu Takedomi, Urawa; Makoto Namekawa, and Yukihiko Haikawa, both of Iwaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha; Akai Electric Company Limited and Alpine Electronics, Inc., all of Tokyo, Japan

Continuation-in-part of Ser. No. 360,570, Mar. 22, 1982, abandoned. This application May 14, 1984, Ser. No. 609,854

Claims priority, application Japan, Mar. 25, 1981, 56-43475; Mar. 25, 1981, 56-43476

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—37 **19 Claims**



1. An error correcting and controlling system used with a PCM decoder and comprising:

(a) first syndrome generator means for generating a syndrome S_1 given by the subsequently mentioned expression (1) on the basis of an error correcting word P and sampled words A_n to A_{n+2}, and B_n to B_{n+2} which comprise data to be reproduced;

(b) a second syndrome generator means for generating the product of a T^{i-7} and a syndrome S_2 given by the subsequently mentioned expression (2) on the basis of an error correcting word Q and said sampled words A_n to A_{n+2}, and B_n to B_{n+2};

(c) a third syndrome generator means operatively connected to said first and second syndrome generator means and consisting of an adder used to generate a syndrome S_i given by the subsequently mentioned expression (3) on the basis of outputs from said first and second syndrome generator means;

(d) a first detector means operatively connected to said second syndrome generator means for detecting $S_1=0$ and $T^{i-7}S_2=0$ with respect to the S_i and T^{i-7} respectively forming said outputs from said first and second syndrome generator means;

(e) a CRC checking means for detecting whether error correcting words P and Q and said sampled words A_n to A_{n+2} and B_n to B_{n+2} are correct or erroneous and for delivering CRC pointer signals in accordance with said error correcting words and said sampled words on the basis of the result of said detection;

(f) a decoder means operatively connected to said CRC checking means for decoding the number of CRC pointers on the basis of said CRC pointer signals from said CRC checking means in accordance with said error correcting words and said sampled words;

(g) a second detector means for detecting a value of i rendering S_i equal to zero, S_i corresponding to the product of an output from said second syndrome generator means multiplied by T_i times through a feedback loop connected thereto, wherein $1 \leqq i \leqq 6$; and

(h) a correcting means for effecting error correction by adding said syndrome S_1 to an i-th sampled word with a modulo 2 addition upon the detection of a value of i from said second detector means when the number of CRC pointers is equal to zero, and $S_1 \neq 0$ and $T^{i-7}S_2 \neq 0$, wherein the expressions (1), (2) and (3) are given by:

$$S_1 = A_n \oplus B_n \oplus A_{n+1} \oplus B_{n+1} \oplus A_{n+2} B_{n+2} \oplus P_n$$

$$S_2 = T^6 A_n \oplus T^5 B_n \beta T^4 A_{n+1} \oplus T^3 B_{n+1} \oplus T^2 A_{n+2} \oplus TB_{n+2} \oplus Q_n$$

and

$$S_i = S_1 \neq T^{i-7} S_2$$

respectively, A_n, A_{n+1} and A_{n+2} designate sampled signal words which are sampled on one of two channels at sampling times and alternating sampled signal words B_n, B_{n+2} sampled on the other channel at the common sampling times staggered from the corresponding sampling times for A_n, A_{n+1} and A_{n+2} by one half the sampling time, n is an integer and designates a sampling time point, i is an integer and $1 \leqq i \leqq 6$, T designates a Q generating matrix given by:

$$T = \begin{bmatrix} 0000000000000 & 1 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ I & 0 \\ & 1 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{bmatrix}$$

where I designates a thirteenth order unit matrix, and the number of CRC pointers is defined to be equal to the number of error correcting words detected by said checking means CRC from among eight words.

4,604,748

DATA PROCESSING SYSTEM WITH ERROR CORRECTION

Fumitaka Sato, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 3, 1984, Ser. No. 567,912

Claims priority, application Japan, Jan. 24, 1983, 58-8772

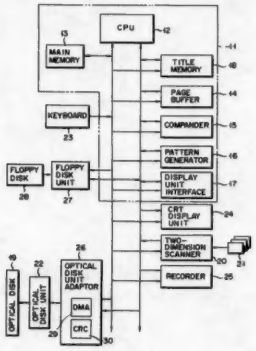
Int. Cl.[4] G06F *11/10*; G11C *29/00*

U.S. Cl. 371—38 **12 Claims**

1. A data processing system designed to handle a large amount of high-redundant data which allows for a low frequency of occurrence of errors, and a small amount of low-redundant data which allows for a very low frequency of occurrence of errors, which data processing system has a memory device with a large capacity for storing high-redundant and low-redundant data at an insufficiently low frequency of error, said data processing system comprising:

first error correction means for correcting the errors of said high- and low-redundant data, so that said high- and low-redundant data may be set within a tolerable error range when said high- and low-redundant data are read out from or written into said memory device; and

second error correction means for double recording the low redundant data onto said memory device and for executing error correction on each item of the double-recorded low redundant data.



4,604,749

SEMICONDUCTOR MEMORY

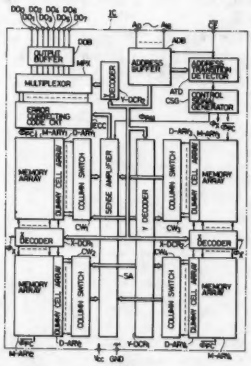
Takashi Shinoda, Kodaira; Kikuo Sakai, Hachiohji; Masahiro Ogata; Hiroshi Kawamoto, both of Kodaira; Yoshiaki Onishi, deceased, late of Kokubunji, and Junko Onishi, administratrix, Nagoya, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,636

Claims priority, application Japan, Jun. 9, 1982, 57-97826; Jun. 9, 1982, 57-97825

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—38 **3 Claims**



1. A semiconductor memory comprising:

a plurality of external output terminals;

a plurality or memory cells formed in one semiconductor chip for storing a plurality of sets of data each having check bits;

a selecting circuit which is formed in said semiconductor chip and which selects some of said memory cells to be formed into one set in response to first address signals;

an error correcting code circuit formed in said semiconductor chip and supplied with one set of data read out from the selected memory cells;

a tristate circuit formed in said semiconductor chip, having a plurality of output terminals and supplied with data delivered from said error correcting code circuit; and

a control circuit formed in said semiconductor chip for forming a control signal for controlling said tristate circuit;

wherein the output terminals of said tristate circuit are coupled with said external output terminals, and wherein said tristate circuit is controlled by the control signal of said control circuit so as to bring said external output terminals into high impedance at least during the time when said error correcting code circuit is delivering indefinite data.

4,604,750

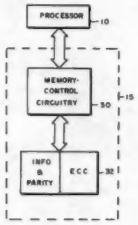
PIPELINE ERROR CORRECTION

John C. Manton, Marlboro; William F. Bruckert, Hudson, and Alfred J. Dellicicchi, Acton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 7, 1983, Ser. No. 549,610

Int. Cl.[4] G06F *11/10*; G11C *29/00*

U.S. Cl. 371—38 **6 Claims**



1. In a data processing system, the combination comprising:

A. a memory circuit including a plurality of data locations for storing data, such as instructions and operands, and separate error-detection and error-correction codes associated with the data;

B. processor means including:

(i) means for generating memory-request signals that represent requests for the memory to send instructions and operands designated thereby;

(ii) means for receiving the requested instructions and operands and the error-detection codes associated therewith and examining each received instruction and operand and the error-detection codes associated therewith to determine whether an error is present in that instruction or operand; and

(iii) means for executing an instruction without applying it to error-correction circuitry if no error is detected in that instruction and any operand designated thereby and repeating the memory-request signal for that instruction if an error has been detected in that instruction or in an operand designated thereby; and

C. memory control means connected to receive the memory-request signals from the processor means, the memory control means including:

(i) means for operating the memory circuit to retrieve instructions and operands in response to the memory-request signals, and for operating the memory circuit to retrieve the error-correction code associated with an instruction or operand if an error is detected therein;

(ii) means for examining the retrieved instructions and operands and their associated error-detection codes to determine whether errors exist therein;

(iii) means for forwarding the instructions and operands and associated error-detection codes to the processor means without waiting for the determination of whether errors exist; and

(iv) means for correcting any correctable detected error in accordance with that error-correction code,

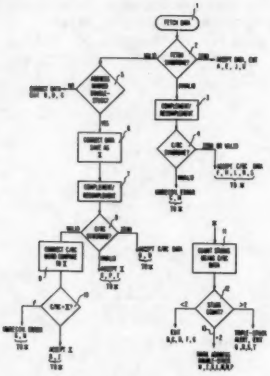
the data-processing system thereby providing for retrieval of correct instructions and operands without the delay required for error detection but still providing the capability for correction of errors in incorrect instructions and operands without correction by the processor means.

4,604,751

ERROR LOGGING MEMORY SYSTEM FOR AVOIDING MISCORRECTION OF TRIPLE ERRORS

Frederick J. Aichelmann, Jr., and Philip M. Ryan, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,275
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **8 Claims**



1. Means for producing a suspected triple bit error alerting signal, said signal producing means extending the error detection capability of a single bit error detection and correction/-double bit error detection code means used in a memory system wherein multiple bit word signals are fetched from memory from respective memory addresses and applied to said code means, said signal producing means including

means for storing first signals representing the addresses of blocks of fetched word signals wherein a double bit error is detected by said code means,

address comparison means receiving said stored first signals,

means for applying to said address comparison means second signals representing the address of each fetched word wherein a single bit error is detected by said code means,

said address comparison means producing said suspected triple bit error alerting signal upon coincidence of the addresses of said double bit error words and said single bit error word represented by said first and second signals respectively.

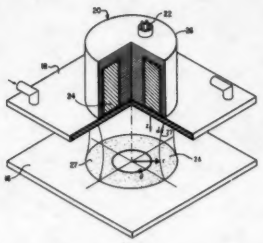
4,604,752

MAGNETIC STABILIZATION OF HIGH POWER GLOW DISCHARGES

Herb J. J. Sequin, 7840 - 44th Avenue, Edmonton, Alberta, Canada P6K 0Z1; Kyong H. Nam, 11130 - 24A Avenue, Edmonton, Alberta, Canada T6J 4Y9, and Clarence E. Capjack, 5403 143rd Street, Edmonton, Alberta, Canada T6H 4E4

Filed Jul. 14, 1981, Ser. No. 283,181
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—29 **35 Claims**

1. For use in a glow discharge device including a discharge volume containing charged and neutral particles and a discharge electric field across the discharge volume said field having a discharge current, a method of stabilizing the said device against electrothermal instabilities and electrode induced instabilities comprising imposing a profiled magnetic



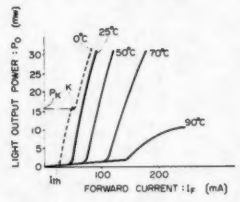
field on the discharge current so as to create a sheared flow system comprising the charged and neutral particles within the discharge volume.

4,604,753

SEMICONDUCTOR LASER MODULE HAVING AN IMPROVED TEMPERATURE CONTROL ARRANGEMENT

Masaaki Sawai, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1983, Ser. No. 554,959
Claims priority, application Japan, Nov. 24, 1982, 57-204645
Int. Cl.[4] H01S *3/045*
U.S. Cl. 372—36 **16 Claims**



1. A semiconductor laser module comprising:

a semiconductor laser element;

a semiconductor submount of a first conductivity type which supports said semiconductor laser element;

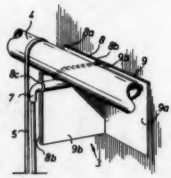
a semiconductor region of a second conductivity type opposite to said frist conductivity type formed in said submount and located adjacent to said laser element so as to form a PN-junction element for detecting heat developing from said laser element and an ambient temperature in the area of said laser element; and

a thermoelectric heat pump which is electrically connected to said PN-junction element and which is coupled to said laser element to control the temperature of said laser element in accordance with an output signal from said PN-junction element.

4,604,754
SUSPENSION DEVICE FOR RESISTOR ELEMENTS IN FURNACES

John H. Haglund, Hallstahammar, Sweden, assignor to Bulten-Kanthal AB, Hallstahammar, Sweden

PCT No. PCT/SE83/00127, § 371 Date Nov. 28, 1983, § 102(e) Date Nov. 28, 1983, PCT Pub. No. WO83/03517, PCT Pub. Date Oct. 13, 1983
PCT Filed Apr. 5, 1983, Ser. No. 557,288
Claims priority, application Sweden, Apr. 2, 1982, 8202145
Int. Cl.[4] H05B *3/06*
U.S. Cl. 373—130 11 Claims

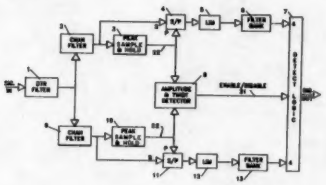


1. Suspension device for loop-shaped electrical resistor elements (5, 5', 5'') having loops in a furnace having a wall, comprising a rod element (4;4', 4'') resting substantially horizontally on consoles (2, 3; 11; 26) which support said loops in closely located winding coils substantially in a flattened helical configuration, wherein the terminal portion (7) of the resistor element are located adjacent to the rod element (4,4', 4'') and the consoles (2, 3; 11; 26) also serve as spacer elements for suspension of the resistor element coils, so that the latter hang freely from the rod element (4,4',4'') at a distance from the furnace wall (1) and cover a relatively large surface area thereof, the rod element (4,4',4'') and the suspended resistor element (5,5',5'') being removable as a unit from the furnace.

4,604,755
FEED FORWARD DUAL CHANNEL AUTOMATIC LEVEL CONTROL FOR DUAL TONE MULTI-FREQUENCY RECEIVERS

Jack T. Murray, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 1, 1984, Ser. No. 616,087
Int. Cl.[4] H04B *1/16;* H04M *1/50*
U.S. Cl. 375—98 6 Claims



2. The method of controlling signal level gain for a dual tone multifrequency receiver comprising steps of:

separating incoming dual tone multifrequency signals into at least two separate tone group channels by passing said incoming signal through separate channel filter banks;

sampling the output of each of said filter banks independently and isolating the absolute magnitude value of the signal level in each said sample;

comparing each said sample against previously stored sample magnitude that represents a peak value;

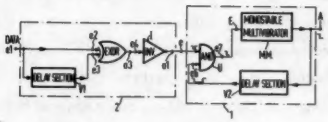
storing each new sample as a new peak value when its value is greater than or equal to said stored peak value; and

dividing each said sample by said stored peak value to form a signal level normalized ratio for application to an envelope limiter thereby providing separate channel automatic signal level control for each of the two channels in a dual tone multifrequency receiver

4,604,756
DEVICE FOR RECOVERING A SYNCHRONIZED CLOCK SIGNAL FROM A SIGNAL SEQUENCE

Steven Moustakas, and Hans-Hermann Witte, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,964
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311677
Int. Cl.[4] H04L *7/02, 7/06*
U.S. Cl. 375—113 4 Claims



1. A device for the recovery of an output clock signal from a random signal sequence, characterized by a clock generator (1) comprising a monostable multivibrator (M.M.) with an input (E) and an output (A), in which an appearance of a specific signal change (Z) at the input (E) triggers the output clock signal which is delivered at the output (A) and which likewise shows the specific signal change (Z);

the output (A) of the multivibrator being connected to a delay element (V2), which provides a delayed output, the delay being approximately equal to the clock pulse length of the output clock signal, to one input (e6) of a gate (U) which comprises two inputs (e and e6) and one output (e7), the one output of the gate being connected to the input (E) of the multivibrator, and to whose second input (e) certain signals (a1) from the random signal sequence are applied, and the gate transmitting to the input (E) of the multivibrator the specific signal change (Z) for each output clock signal of the multivibrator and also the specific signal change (Z) of the certain signals from the ramdom sequence,

and a signal forming means (2) which comprises an additional delay element (V1) and an exclusive OR element with two inputs (e2, e3) and one output (a3), the random signal sequence being applied at one input (e2) of the exclusive OR element, this one input (e2) being connected by the additional delay element (V1) to the other input (e3) of the exclusive OR element, and the output (a3) of the signal forming means being connected with the input (e) of the gate (U) whose output is connected to the monostable multivibrator.

4,604,757
PAPER SACK WITH A VALVE FOR PACKAGING PULVERIZED OR GRANULAR MATERIALS

Masayoshi Yokomatsu, 25-11-25, Fukawa, Tone-machi, Kita-Soma-Gun, Ibaragi Prefecture, Japan

Continuation of Ser. No. 415,183, Sep. 7, 1982, abandoned. This application Jul. 5, 1984, Ser. No. 626,596
Claims priority, application Japan, Sep. 7, 1981, 56-140721; Nov. 20, 1981, 56-187506; Dec. 3, 1981, 56-194741
Int. Cl.[4] B65D *30/24*
U.S. Cl. 383—46 5 Claims

1. A paper valve sack, comprising:

a flattened paper tube having a longitudinal axis;

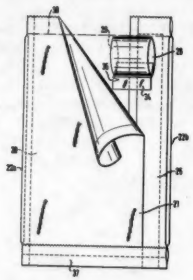
a first end of said flattened tube being folded closed along a first line, said first line being substantially transverse to said longitudinal axis;

a second end of said flattened tube being folded closed along

a second line, said second line being substantially transverse to said longitudinal axis;

said flattened tube defining first and second sides, said first side comprising a first strip and a second strip, said first strip being folded over said second strip to form a longitudinal seam which extends at least from said first line to said second line;

a collapsible filling valve in said longitudinal seam between said first and second strips, said collapsible filling valve comprising an outer filling orifice and a projecting strip, said outer filling orifice and said projecting strip being oriented transverse to said longitudinal axis, and means including said projecting strip being secured at its respective sides to the first and second strips and between said first and second lines, whereby said projecting strip distributes forces arising in the vicinity of said filling valve during filling of said paper valve sack, thereby reducing

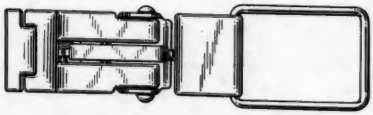


tensile stresses and the tendency to rupture resultant therefrom.

DESIGNS

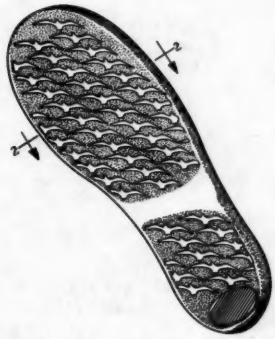
AUGUST 5, 1986

284,900
SKI BOOT BUCKLE
Edward L. Chalmers, II, and David C. Everest, III, both of Boulder, Colo., assignors to Lange International S.A., Fribourg, Switzerland
Filed Jul. 28, 1983, Ser. No. 518,441
Term of patent 14 years
U.S. Cl. D2—314



284,901
INSOLE FOR SHOES USED IN LATERAL SPORTS
Harvey G. Tilles, P.O. Box 5466, 614 N. Hamilton St., High Point, N.C. 27262
Continuation-in-part of Ser. No. 387,255, Jun. 10, 1982, abandoned. This application May 17, 1984, Ser. No. 611,085
Term of patent 14 years
U.S. Cl. D2—318

284,902
FOOTWEAR SOLE
Paul A. Lindh, 9 Pell St., Newport, R.I. 02840
Filed Feb. 9, 1984, Ser. No. 578,482
Term of patent 14 years
U.S. Cl. D2—321

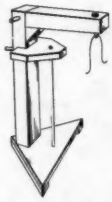


284,903
CARRIER FOR CASSETTE PLAYER AND CASSETTES
Barbara A. Rose, 330-44 Windward Cir., Aurora, Ohio 44202
Filed Oct. 18, 1983, Ser. No. 543,020
Term of patent 14 years
U.S. Cl. D2—383

284,904
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Mar. 30, 1984, Ser. No. 595,058
Term of patent 14 years
U.S. Cl. D2—405

284,905
BELT BUCKLE
Alexis Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Nov. 27, 1984, Ser. No. 675,293
Term of patent 14 years
U.S. Cl. D2—422

284,906
YARN HOLDER
Ethel V. Richter, 4608 Morris, Victoria, Tex. 77901
Filed Mar. 5, 1984, Ser. No. 586,382
Term of patent 14 years
U.S. Cl. D3—26

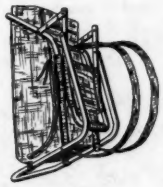


284,907
GOLF CARRIER
James W. Wiedeman, Box 133B, Mill Run, Pa. 15464
Filed Nov. 1, 1982, Ser. No. 438,337
Term of patent 14 years
U.S. Cl. D3—37

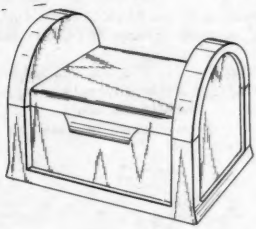
284,908
BROOM CAP
Robert J. Libman, Champaign, Ill., assignor to Libman Broom Company, Arcola, Ill.
Filed May 3, 1984, Ser. No. 606,868
Term of patent 14 years
U.S. Cl. D4—199

284,909
PICTURE FRAME
Robert E. Johnson, Box 112, Castlewood, S. Dak. 57223
Continuation-in-part of Ser. No. 461,591, Jan. 27, 1983. This application Jun. 1, 1984, Ser. No. 616,541
Term of patent 14 years
U.S. Cl. D6—303

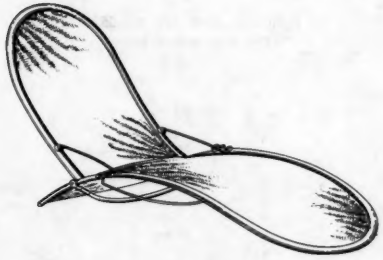
284,910
COMBINED BACK PACK AND CHAIR
Mark R. Handy, 2934 La Vante, Carlsbad, Calif. 92008
Filed Jan. 9, 1984, Ser. No. 569,338
Term of patent 14 years
U.S. Cl. D6—336



284,911
STEP STOOL
Gary R. Lemmeyer, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 2, 1984, Ser. No. 576,262
Term of patent 14 years
U.S. Cl. D6—349

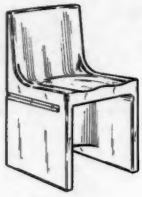


284,912
LOUNGE CHAIR
Gys Bakker, Amersfoort, and Frans van den Toorn, Amdyle, both of Netherlands, assignors to Industrial Designers Bussum B.V., Naarden, Netherlands
Filed Jan. 16, 1984, Ser. No. 570,982
Term of patent 14 years
U.S. Cl. D6—361

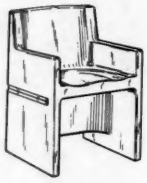


284,913
ARM CHAIR
Didier Deconinck, Seyssins, France, assignor to Allibert SA, Grenoble Cedex, France
Filed Feb. 9, 1984, Ser. No. 578,745
Claims priority, application Hague, Aug. 12, 1983, DM-002786
Term of patent 14 years
U.S. Cl. D6—368

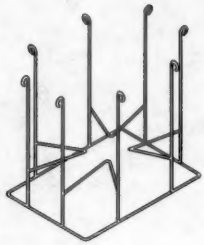
284,914
CHAIR
Leonard M. Nemschoff, and Mark S. Nemschoff, both of Sheboygan, Wis., assignors to Nemschoff Chairs, Inc., Sheboygan, Wis.
Filed Nov. 21, 1983, Ser. No. 553,548
The portion of the term of this patent subsequent to Aug. 5, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—375



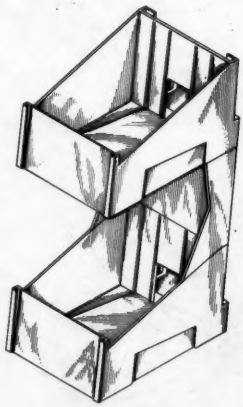
284,915
ARMCHAIR
Leonard M. Nemschoff, and Mark S. Nemschoff, both of Sheboygan, Wis., assignors to Nemschoff Chairs, Inc., Sheboygan, Wis.
Filed Nov. 21, 1983, Ser. No. 553,549
Term of patent 14 years
U.S. Cl. D6—375



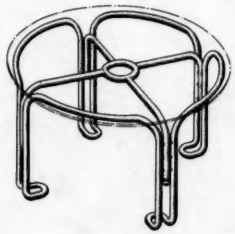
284,916
NEWSPAPER RACK
Dwight W. Marks, P.O. Box 26732, San Jose, Calif. 95159
Filed Apr. 30, 1984, Ser. No. 605,115
Term of patent 14 years
U.S. Cl. D6—462



284,917
POINT OF SALE DISPLAY MODULE
Stanton J. Canter, Carversville, Pa., assignor to Diversified Group, Inc., Doylestown, Pa.
Filed Feb. 14, 1984, Ser. No. 580,144
Term of patent 14 years
U.S. Cl. D6—476

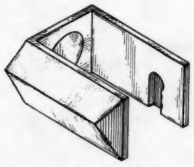


284,918
TABLE FRAME
William McBride, 1110 W. Barry St., Chicago, Ill. 60657
Filed Jan. 25, 1984, Ser. No. 573,978
Term of patent 14 years
U.S. Cl. D6—488

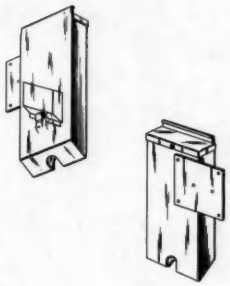


284,919
OCCASIONAL TABLE
George L. Garcia, Naperville, and Robert G. Kopp, Carol Stream, both of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Apr. 2, 1984, Ser. No. 595,699
Term of patent 14 years
U.S. Cl. D6—488

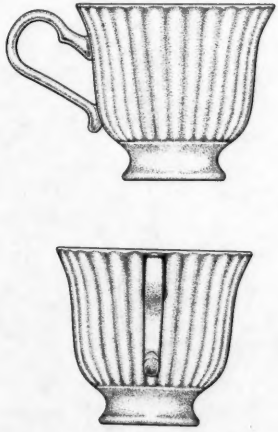
284,920
CONNECTING BRACKET FOR FURNITURE
James Van Horn, Rte. 2, Box 166, Mundelein, Ill. 60060
Filed Oct. 21, 1983, Ser. No. 544,275
Term of patent 14 years
U.S. Cl. D6—191



284,921
DISPENSER FOR CARDS
Ernest E. Hansen, P.O. Box 272, San Juan Capistrano, Calif. 92693
Filed Jan. 24, 1984, Ser. No. 573,428
Term of patent 14 years
U.S. Cl. D6—515



284,922
CUP
Katsuhiro Otake, Mie, Japan, assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Jul. 27, 1983, Ser. No. 517,785
Term of patent 14 years
U.S. Cl. D7—9



284,923

TUMBLER OR SIMILAR ARTICLE

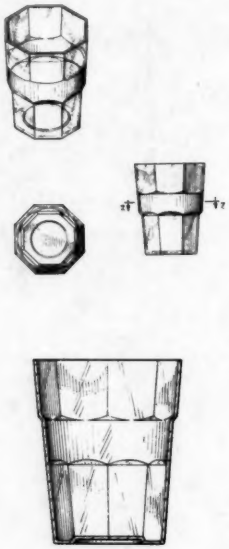
Joost R. Ritman, Bloemgracht 15-19, 1016 KB Amsterdam, Netherlands

Filed Oct. 5, 1983, Ser. No. 539,373

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1983, URA 391/83

Term of patent 14 years

U.S. Cl. D7—14



284,924

SPOON OR SIMILAR ARTICLE

Ellen B. Manderfield, Sherrill, N.Y., assignor to Oneida Ltd., Oneida, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,299

Term of patent 14 years

U.S. Cl. D7—137

284,925

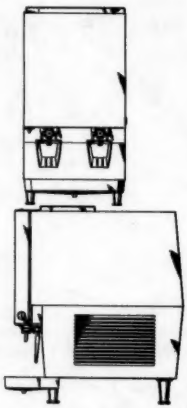
BEVERAGE DISPENSER

Leonard J. Jacobs, Chestnut Hill, and Michael J. Riley, Pembroke, both of Mass., assignors to Jet Spray Corporation, Norwood, Mass.

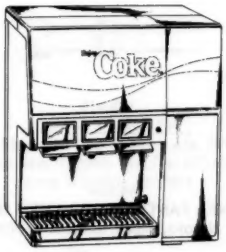
Filed Sep. 21, 1984, Ser. No. 653,439

Term of patent 14 years

U.S. Cl. D7—308

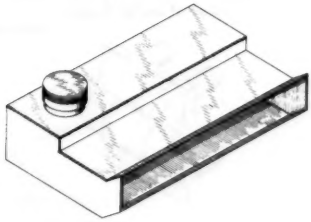


284,926
BEVERAGE DISPENSER
Jason K. Sedam, Dunwoody; Richard J. Mueller, Atlanta; Andrew J. Holoubek, and Samuel C. Crosby, both of Stone Mountain, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Continuation of Ser. No. 531,254, Sep. 12, 1983, abandoned, which is a continuation of Ser. No. 320,477, Nov. 12, 1981, Pat. No. Des. 273,654. This application Oct. 16, 1985, Ser. No. 788,164
Term of patent 14 years
U.S. Cl. D7—308



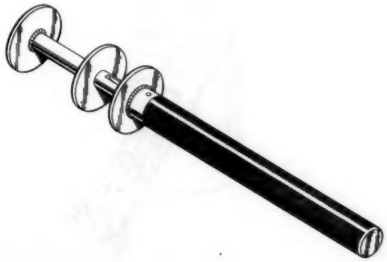
284,927
INSULATED JUG
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmerman, Niederaula, Fed. Rep. of Germany
Filed Feb. 7, 1983, Ser. No. 464,694
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, MR182
Term of patent 14 years
U.S. Cl. D7—317

284,928
STOVE
Stanley N. Clark, Box 71, Milo, Me. 04463
Filed Dec. 17, 1984, Ser. No. 682,605
Term of patent 14 years
U.S. Cl. D7—323

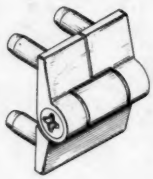


284,929
OUTDOOR BARBECUE COOKER
Erich J. Schlosser, Lindenhurst, and James C. Stephen, Arlington Heights, both of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Filed Aug. 10, 1984, Ser. No. 639,918
Term of patent 14 years
U.S. Cl. D7—332

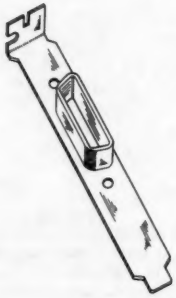
284,930
GROUND ROD DRIVING HAMMER
David B. Richards, 33465 Caliban Dr., Fremont, Calif. 94536
Filed Dec. 20, 1983, Ser. No. 563,406
Term of patent 14 years
U.S. Cl. D8—70

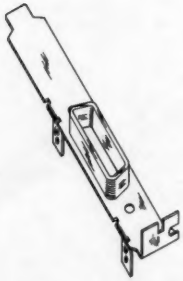


284,931
ADJUSTABLE FRICTION HINGE
Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.
Filed Nov. 8, 1984, Ser. No. 669,667
Term of patent 14 years
U.S. Cl. D8—327

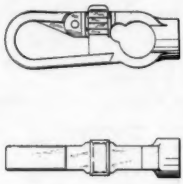


284,932
BRACKET FOR ELECTRONIC EQUIPMENT
R. Alan Beverly, San Luis Obispo, Calif., assignor to Ziatech Corporation, San Luis Obispo, Calif.
Filed Dec. 15, 1983, Ser. No. 561,877
Term of patent 14 years
U.S. Cl. D8—373





284,933
SHACKLE
Jack J. Murphy, Chapel Elms, Chapel La., West Wittering, West Sussex, England
Filed Aug. 2, 1983, Ser. No. 519,749
Claims priority, application United Kingdom, Feb. 3, 1983, 1011234; Feb. 3, 1983, 1011235
Term of patent 14 years
U.S. Cl. D8—382



284,934
PANEL FASTENER OR THE LIKE
Toshiya Okawa, Nagoya, Japan, assignor to Nifco, Inc., Yokohama, Japan
Filed Oct. 19, 1983, Ser. No. 543,595
Claims priority, application Japan, Apr. 18, 1983, 58-16101
Term of patent 14 years
U.S. Cl. D8—386

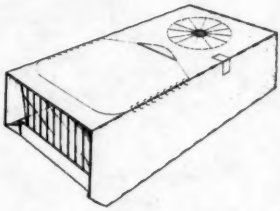
284,935
PLANTING POT CLAMP FOR SUSPENDED SUPPORTS
Velma M. Shaw, 3711 Summer Shore La., Westlake Village, Calif. 91361
Filed May 10, 1984, Ser. No. 609,282
Term of patent 14 years
U.S. Cl. D8—394

284,936
ANTENNA ELEMENT-BOOM CLAMP
Donald R. Newcomb, San Marcos, Tex., assignor to Butternut Electronics Co., Lockhart, Tex.
Filed Mar. 17, 1983, Ser. No. 476,069
Term of patent 14 years
U.S. Cl. D8—396

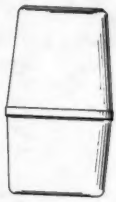
284,937
DOOR KNOCKER
Clint Shaw, 552 Sherwood Dr., Auburn, Ala. 36830
Filed May 7, 1984, Ser. No. 607,412
Term of patent 14 years
U.S. Cl. D8—401

284,938
BOTTLE
Maurice Jedwab, 22 Rue de la Tourelle, 92100 Boulogne, France, and Henri Jedwab, 163 Avenue Victor Hugo, 75016 Paris, France
Filed Aug. 12, 1983, Ser. No. 522,712
Claims priority, application France, Feb. 25, 1983, 830728
Term of patent 14 years
U.S. Cl. D9—307

284,939
PACKAGING CONTAINER FOR FOOD AND BEVERAGES
George R. Sandish, Annapolis, Md.; Henry Wischusen, III, Lilburn, Ga., and George Nemeskeri, Nova Scotia, Canada, assignors to The Coca-Cola Company, Atlanta and Rock Tenn, Norcross, both of, Ga.
Filed Aug. 25, 1983, Ser. No. 526,575
Term of patent 14 years
U.S. Cl. D9—346



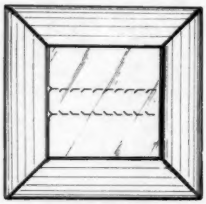
284,940
PACKAGING CONTAINER
Vincent E. Fortuna, Huntington Beach, Calif., and Donald N. MacLaughlin, Midland, Mich., assignors to Vercon, Inc., Dallas, Tex.
Filed Apr. 30, 1984, Ser. No. 605,446
Term of patent 14 years
U.S. Cl. D9—349



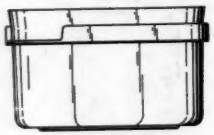
284,941
JAR OR THE LIKE
Don D. Porteous, 2794 Moraga Dr., Los Angeles, Calif. 90024
Filed Mar. 19, 1984, Ser. No. 590,633
Term of patent 14 years
U.S. Cl. D9—378

284,942
BOTTLE OF PERFUME OR TOILET WATER
Pierre Dinand, Levallois-Perret, France, assignor to Co. Pr. A., Spa-Via Giacomo Watt 13, Milan, Italy
Filed Apr. 26, 1983, Ser. No. 488,725
Claims priority, application France, Nov. 10, 1982, 823908
Term of patent 14 years
U.S. Cl. D9—403

284,943
MICROWAVE COOKING CARTON
George P. Webinger, Robbinsdale, Minn., assignor to Waldorf Corporation, St. Paul, Minn.
Filed Feb. 13, 1984, Ser. No. 579,371
Term of patent 14 years
U.S. Cl. D9—416



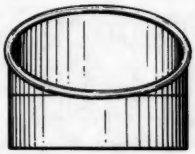
284,944
CONTAINER FOR FOOD
Arthur R. Carlson, East Malvern, Australia, assignor to The Decor Corporation PTY, LTD, Scoresby, Australia
Filed Jul. 14, 1983, Ser. No. 513,720
Term of patent 14 years
U.S. Cl. D9—425

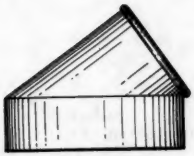


284,945
COMBINED TRAY AND COVER
Wilfred L. Jones, Crafta Webb, and Nigel A. Dent, Headington, both of England, assignors to Imperial Chemical Industries PLC, London, England
Filed Apr. 12, 1984, Ser. No. 599,556
Claims priority, application United Kingdom, Oct. 12, 1983, 1015629
Term of patent 14 years
U.S. Cl. D9—425

284,946
BOTTLE CAP
Jacques Augros, Villiers le Bel, France, assignor to J. Augros et Cie Société Anonyme Francaise, France
Filed Jul. 11, 1983, Ser. No. 512,340
Claims priority, application France, Apr. 13, 1983, 831365
Term of patent 14 years
U.S. Cl. D9—435

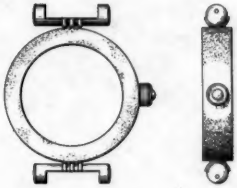
284,947
AEROSOL CAN OVERCAP
Michael A. Cousins, New York, N.Y., assignor to Bristol-Myers Company, New York, N.Y.
Filed Oct. 5, 1983, Ser. No. 539,247
Term of patent 14 years
U.S. Cl. D9—445



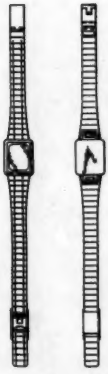


284,948
COMBINED WRISTWATCH AND TOY ANIMAL FIGURE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,426
Term of patent 14 years
U.S. Cl. D10—34

284,949
WATCH FRAME
Hung W. Kong, No. 5, Wanchai Rd., Fifth Floor, Hong Kong, Hong Kong
Filed Apr. 16, 1984, Ser. No. 600,822
Term of patent 14 years
U.S. Cl. D10—128



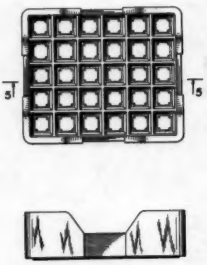
284,950
WATCH STRAP
Fu Hong Lai, Kowloon, Hong Kong, assignor to Hong Nin Metal Works Factory Co. Ltd., Kwai Chung, Hong Kong
Filed May 10, 1984, Ser. No. 609,106
Claims priority, application United Kingdom, Nov. 22, 1983, 1016412
Term of patent 14 years
U.S. Cl. D11—3



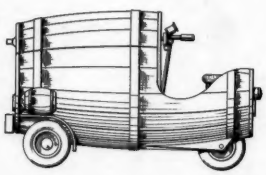
284,951
WATCH BAND
Jean-Pierre Chodat, Auvernier, Switzerland, assignor to Fabrique Ebel, Societe Anonyme, Switzerland
Filed Jun. 12, 1984, Ser. No. 619,810
Claims priority, application Int'l Pat. Institute, Dec. 13, 1983, DM/003 202
Term of patent 14 years
U.S. Cl. D11—4

284,952
EARRING
William M. Ricks, 1104 Moccasin Tr., Kokomo, Ind. 46902
Filed Jul. 23, 1984, Ser. No. 633,709
Term of patent 14 years
U.S. Cl. D11—75

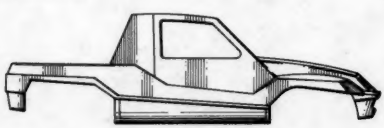
284,953
BOX FOR CULTIVATING VEGETABLES OR THE LIKE
Toshiro Kaneko, 20-3, Nakashinden, Yaizu-shi, Shizuoka-ken, Japan
Filed Oct. 18, 1983, Ser. No. 543,100
Term of patent 14 years
U.S. Cl. D11—155



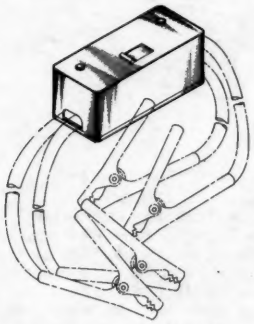
284,954
CARBONATED BEVERAGE VEHICLE
Bernard D. Lamb, 4316 S. A St., Tacoma, Wash. 98408
Filed Sep. 21, 1984, Ser. No. 652,970
Term of patent 14 years
U.S. Cl. D12—83



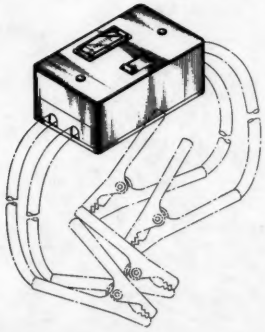
284,955
VEHICLE BODY
Nicolaas D. Loubser, Kempton Park, South Africa, assignor to Hennic (Proprietary) Limited, South Africa
Filed May 4, 1984, Ser. No. 607,138
Claims priority, application South Africa, Dec. 15, 1983, 83/1112
Term of patent 14 years
U.S. Cl. D12—98



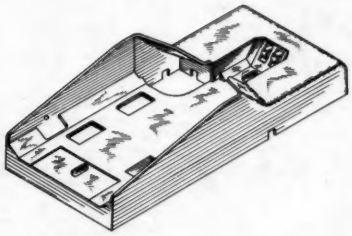
284,956
JUMPER CABLE CONTROL BOX
Bobby L. Bates, San Dimas, Calif., assignor to Bates R&D, Inc., San Dimas, Calif.
Filed Jan. 19, 1984, Ser. No. 571,835
Term of patent 14 years
U.S. Cl. D13—5



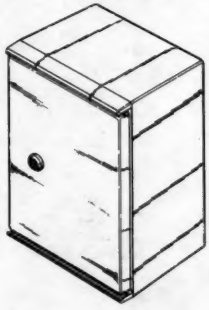
284,957
COMBINED JUMPER CABLE CONTROL BOX AND METER
Bobby L. Bates, San Dimas, Calif., assignor to Bates R&D, Inc., San Dimas, Calif.
Filed Jan. 19, 1984, Ser. No. 571,836
Term of patent 14 years
U.S. Cl. D13—5



284,958
CHARGER BASE FOR A BATTERY-OPERATED APPLIANCE OR THE LIKE
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Jul. 6, 1983, Ser. No. 522,880
Term of patent 14 years
U.S. Cl. D13—6



284,959
ELECTRICAL CABINET OR SIMILAR ARTICLE
Franco Berg, Isernhagen, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany
Filed Oct. 7, 1985, Ser. No. 785,284
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, MR 357
Term of patent 14 years
U.S. Cl. D13—40



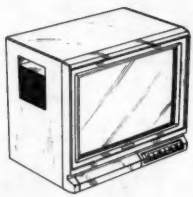
284,960
TELEPHONE
Morty Hova, 29 Seaside Dr., Port Jefferson, N.Y. 11777
Filed May 25, 1984, Ser. No. 613,916
Term of patent 14 years
U.S. Cl. D14—53

284,961
TELEPHONE
Morty Hova, 29 Seaside Dr., Port Jefferson, N.Y. 11777
Filed May 25, 1984, Ser. No. 614,327
Term of patent 14 years
U.S. Cl. D14—53

284,962
TELEPHONE
Morty Hova, 29 Seaside Dr., Port Jefferson, N.Y. 11777
Filed May 25, 1984, Ser. No. 614,326
Term of patent 14 years
U.S. Cl. D14—53

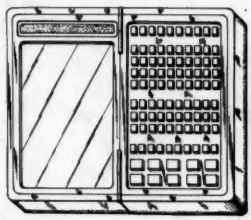
284,963
PROGRAMMABLE AM/FM SCANNING RADIO RECEIVER
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed Jan. 27, 1984, Ser. No. 574,389
Term of patent 14 years
U.S. Cl. D14—71

284,964
TELEVISION RECEIVER
Toru Higashihara, Tokyo; Akira Takahashi, Sayama; Toru Kiyota, Tachikawa, and Takashi Fujii, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 31, 1984, Ser. No. 575,692
Claims priority, application Japan, Sep. 9, 1983, 58-39116
Term of patent 14 years
U.S. Cl. D14—60

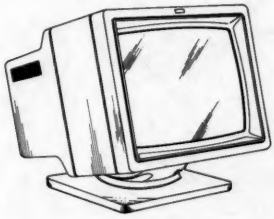


284,965
UHF ANTENNA
Norio Nakamura, Yokohama, Japan, assignor to Suntron Industrial Co., Ltd., Kanagawa, Japan
Filed Mar. 31, 1983, Ser. No. 480,689
Term of patent 14 years
U.S. Cl. D14—86

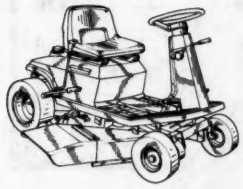
284,966
HAND HELD PORTABLE COMPUTER IN THE FORM OF A BOOK
Frank D. Larkins, Greenville, S.C., assignor to Computer Bibles International, Inc., Greenville, S.C.
Filed Sep. 19, 1983, Ser. No. 533,806
Term of patent 14 years
U.S. Cl. D14—100



284,967
DISPLAY MONITOR
John A. Wiseman, Winchester, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 16, 1983, Ser. No. 562,503
Claims priority, application United Kingdom, Jun. 21, 1983, 1013702
Term of patent 14 years
U.S. Cl. D14—113

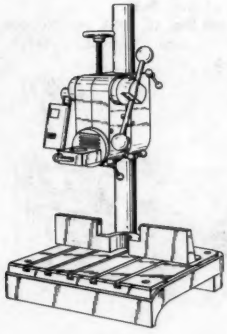


284,968
LAWN TRACTOR
Masahiro Watanabe, and Shungo Yorozu, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 9, 1984, Ser. No. 669,938
Claims priority, application Japan, May 9, 1984, 59-18682
Term of patent 14 years
U.S. Cl. D15—15

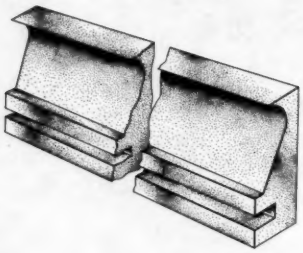


284,969
HONING DISC
Gunnar Olovsson, P.O. Box 3031, S-981 03 Kiruna, Sweden
Filed Oct. 28, 1983, Ser. No. 546,254
Term of patent 14 years
U.S. Cl. D15—126

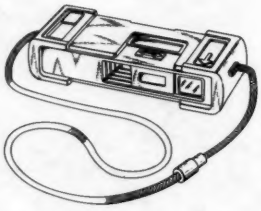
284,970
HAND-DRILL PRESS STAND
Friedrich Wolff, Remscheid, Fed. Rep. of Germany, assignor to Werkzeug GmbH, Fed. Rep. of Germany
Filed Jul. 9, 1984, Ser. No. 629,047
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 5 MR 254
Term of patent 14 years
U.S. Cl. D15—132



284,971
MOLD FOR FORMING SWIMMING POOL COPING
Max W. Deason, 1818 W. Price St., Tucson, Ariz. 85705
Filed Apr. 4, 1983, Ser. No. 481,669
Term of patent 14 years
U.S. Cl. D15—136



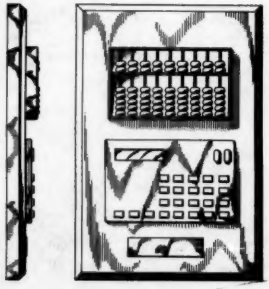
284,972
CAMERA
Robert A. Kolich, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 9, 1984, Ser. No. 578,492
Term of patent 14 years
U.S. Cl. D16—6



284,973
CAMERA WITH INTEGRAL FLASH UNIT
David E. Hansen, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 10, 1984, Ser. No. 649,102
Term of patent 14 years
U.S. Cl. D16—6

284,974
SUNGLASSES
Jean-Pierre Lamy, Geneva, Switzerland, assignor to Lamy Optic Industries, Inc., Miami, Fla.
Filed Feb. 29, 1984, Ser. No. 584,796
Term of patent 14 years
U.S. Cl. D16—102

284,975
COMBINED DESKTOP ABACUS AND ELECTRONIC CALCULATOR
Herbert Kwok, 4118 Bristol Ct., Northbrook, Ill. 60062
Filed Aug. 7, 1984, Ser. No. 638,575
Term of patent 14 years
U.S. Cl. D18—2



284,976

COMBINED CALCULATOR AND CLIPBOARD

Danny Chan Chi Hung, Hong Kong, Hong Kong, assignor to Dah Sun Electronics Company, Limited, Hong Kong, Hong Kong

Filed Aug. 13, 1984, Ser. No. 640,197

Claims priority, application United Kingdom, May 17, 1984, 1019723

Term of patent 14 years

U.S. Cl. D18—2

284,978

INK RIBBON CARTRIDGE

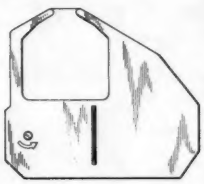
Yoshito Kusabuka, Shiojiri, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,453

Claims priority, application Japan, Sep. 7, 1983, 39049

Term of patent 14 years

U.S. Cl. D18—22



284,977

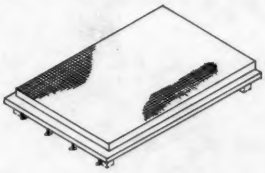
MIMEOGRAPHER

Raymond B. Simmons, 1570 Hudson Ave., San Francisco, Calif. 94124

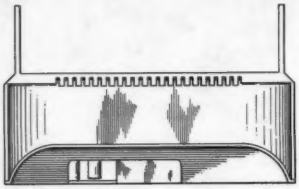
Filed Feb. 15, 1979, Ser. No. 12,442

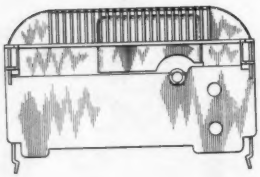
Term of patent 14 years

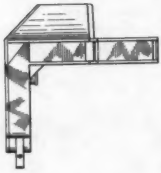
U.S. Cl. D18—18



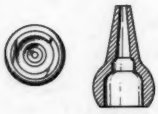
284,979
RIBBON CASSETTE OR SIMILAR ARTICLE
Thomas J. Bossack, Candor, and Louis E. Shipos, Ithaca, both of N.Y., assignors to NCR Corporation, Dayton, Ohio
Filed Aug. 27, 1984, Ser. No. 644,884
Term of patent 14 years
U.S. Cl. D18—22





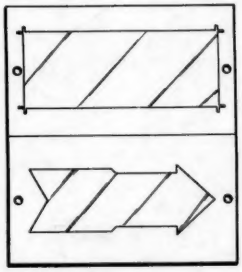


284,980
CRAYON
Kenkichi Yoshida, Tokyo, Japan, assignor to Kabushiki Kaisha Buncho, Tokyo, Japan
Filed Jul. 7, 1983, Ser. No. 512,194
Term of patent 14 years
U.S. Cl. D19—41

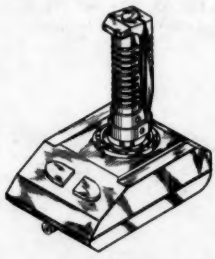


284,981
COMBINED TAG AND CORD FOR BAG CONTAINING MOISTURIZING BEADS OR THE LIKE
Vincent N. Figliola, 301 E. 62nd St., New York, N.Y. 10021
Filed Apr. 20, 1983, Ser. No. 486,723
Term of patent 14 years
U.S. Cl. D20—26

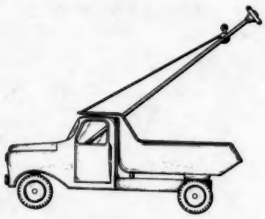
284,982
MARKER
Knut H. Collinder, Åkarp, Sweden, assignor to Ingenjörsfirma Knut Collinder AB, Åkarp, Sweden
Filed Dec. 20, 1983, Ser. No. 563,521
Claims priority, application Sweden, Jun. 23, 1983, 83-1723
Term of patent 14 years
U.S. Cl. D20—40



284,983
CONTROL FOR A VIDEO GAME
Lai-Jin Liu, 2F. #328 Mu Cha Rd. Sec. 1, Mu Cha Ward, Taipei, Taiwan
Filed Nov. 30, 1983, Ser. No. 556,695
Term of patent 14 years
U.S. Cl. D21—48

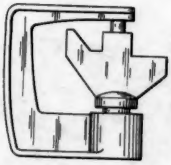


284,984
TOY DUMP TRUCK
Christos Tzanetakos, 405 NE. 114 St., Miami, Fla. 33161
Filed Jun. 4, 1984, Ser. No. 617,178
Term of patent 14 years
U.S. Cl. D21—134

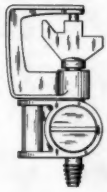


284,985
DOLL
Arlene Bobker, 165 E. 66th St., New York, N.Y. 10021, and Arline Politzer, 315 E. 88th St., New York, N.Y. 10128
Filed Apr. 16, 1984, Ser. No. 601,048
Term of patent 14 years
U.S. Cl. D21—175

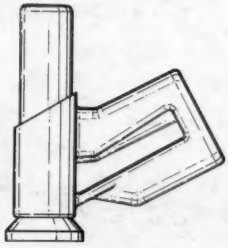
284,986
GARDEN SPRINKLER HEAD
Jack L. Lemkin, Cincinnati, and Eugene A. Zilber, Columbus, both of Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio
Filed Mar. 5, 1984, Ser. No. 586,284
Term of patent 14 years
U.S. Cl. D23—7



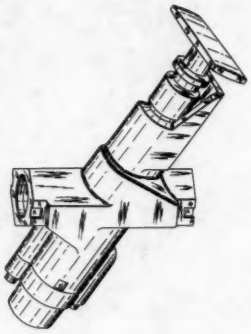
284,987
COMBINED GARDEN SPRINKLER AND VALVE
Jack L. Lemkin, Cincinnati, and Eugene A. Zilber, Columbus, both of Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio
Filed Mar. 5, 1984, Ser. No. 586,286
Term of patent 14 years
U.S. Cl. D23—7



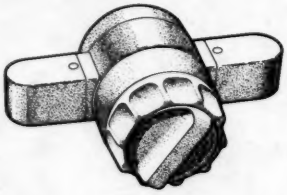
284,988
SPRAY GUN
David Powell, London, England, assignor to Imperial Chemical Industries PLC, London, England
Filed Jul. 25, 1984, Ser. No. 634,359
Claims priority, application United Kingdom, Jan. 25, 1984, 1017508
Term of patent 14 years
U.S. Cl. D23—17



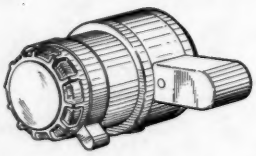
284,989
VALVE
Harold D. Fetty, Birmingham, Mich., assignor to Ross Operating Valve Company, Troy, Mich.
Filed Jun. 13, 1983, Ser. No. 503,779
Term of patent 14 years
U.S. Cl. D23—19



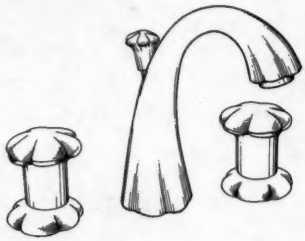
284,990
FLUID MIXING VALVE FOR SHOWERS OR THE LIKE
Kenneth A. Ogilvie, Naunton, England, assignor to Walker Crosweller & Company Limited, England
Filed Oct. 17, 1983, Ser. No. 542,541
Claims priority, application United Kingdom, Jul. 2, 1983, 1013894
Term of patent 14 years
U.S. Cl. D23—19



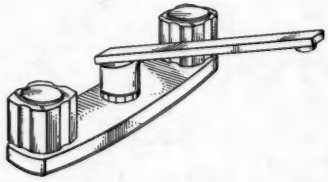
284,991
MIXING VALVE FOR SHOWERS OR THE LIKE
Kenneth A. Ogilvie, Naunton, England, assignor to Walker Crosweller & Company Limited, England
Filed Apr. 11, 1985, Ser. No. 721,923
Claims priority, application United Kingdom, Dec. 4, 1984, 1023714
Term of patent 14 years
U.S. Cl. D23—19



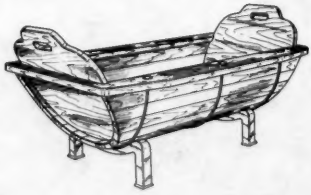
284,992
LAVATORY FAUCET SET
Gerhard E. Joerger, Hans-Thoma-Strasse 89-99, 6800 Mannheim 25, Fed. Rep. of Germany
Filed May 9, 1983, Ser. No. 493,096
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1982, MR V/1247
Term of patent 14 years
U.S. Cl. D23—25



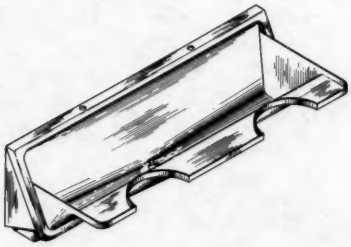
284,993
SINK FAUCET
Holly K. Yost, Van Nuys, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.
Division of Ser. No. 507,524, Jun. 24, 1983. This application Jul. 22, 1985, Ser. No. 757,731
Term of patent 14 years
U.S. Cl. D23—25



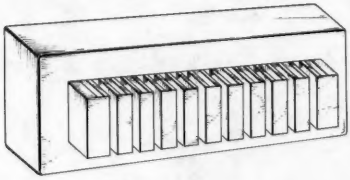
284,994
BATHTUB
Waldemar Rothe, Lutherstr. 9, D-6900 Heidelberg, Fed. Rep. of Germany
Filed Dec. 9, 1983, Ser. No. 559,803
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, MR BD IVNR.370; Jun. 13, 1983, 8317248[U]
Term of patent 14 years
U.S. Cl. D23—56



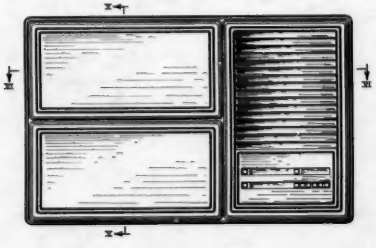
284,995
SURGEON'S SCRUB SINK
Fred V. G. Ekbladh, Postlåda 178, S-430 40 Särö, and Hans Tillander, Humlegårdsgatan 3, S-412 74 Göteborg, both of Sweden
Filed May 3, 1983, Ser. No. 491,055
Claims priority, application Sweden, Nov. 12, 1982, 82-2720
Term of patent 14 years
U.S. Cl. D23—60



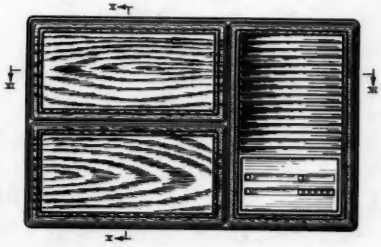
284,996
AIR SUPPLY REGISTER
Knut E. Bergdahl, Kvartsgränd 4, S-852 52 Sundsvall, Sweden
Filed Feb. 6, 1984, Ser. No. 577,259
Term of patent 14 years
U.S. Cl. D23—141



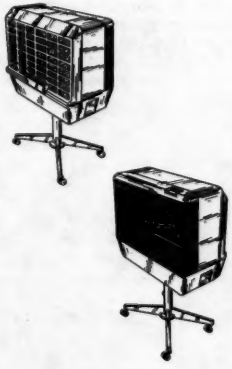
284,997
FRONT PANEL FOR A ROOM AIR CONDITIONER
Walter W. Hoyle, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 28, 1984, Ser. No. 594,649
The portion of the term of this patent subsequent to Aug. 5, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—141



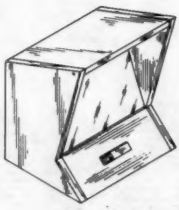
284,998
FRONT PANEL FOR A ROOM AIR CONDITIONER
Walter W. Hoyle, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 28, 1984, Ser. No. 594,648
The portion of the term of this patent subsequent to Aug. 5, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—141



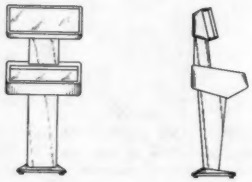
284,999
EVAPORATIVE AIR CONDITIONER
William Worthington, Glenalta, and John R. Ridings, Hope Valley, both of Australia, assignors to Dalgety Australia Operations Limited, Sydney, Australia
Filed Sep. 6, 1983, Ser. No. 529,348
Claims priority, application Australia, Jun. 17, 1983, 4115/83
Term of patent 14 years
U.S. Cl. D23—143



285,000
X-RAY VIEWER
Kent E. Stratton, 2649 Ethel Ave., Fort Wayne, Ind. 46808
Filed Nov. 15, 1983, Ser. No. 552,293
Term of patent 14 years
U.S. Cl. D24—2

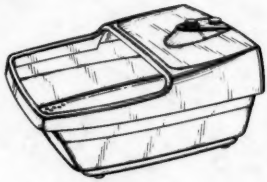


285,001
MEASURING AND CHECKING CONSOLE PARTICULARLY ADAPTED FOR HEART TESTS
Hervé Denis, 16 rue de Condé 75006 Paris, and Jacqueline Becquet, 55 Septième Ave., 60260 Lamorlay, both of France
Filed Sep. 28, 1982, Ser. No. 425,911
Claims priority, application Hague, Aug. 16, 1982, DM 001730
Term of patent 14 years
U.S. Cl. D24—21



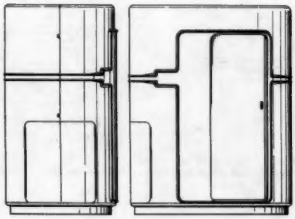
285,002
SURGICAL CLIP APPLICATOR
David T. Green; Richard A. McGarry, both of Norwalk, and Graham Smith, Ridgefield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jul. 27, 1984, Ser. No. 635,284
Term of patent 14 years
U.S. Cl. D24—26

285,003
WHIRLPOOL FOOT MASSAGER
Alfred W. Madl, Glendale, Wis., assignor to Sunbeam Corporation, Oak Brook, Ill.
Filed Jan. 13, 1983, Ser. No. 457,799
Term of patent 14 years
U.S. Cl. D24—38

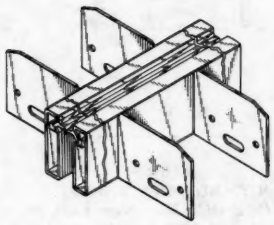


285,004
SURGICAL SUCTION INSTRUMENT
Ronald D. Shippert, 4975 S. Albion, Littleton, Colo. 80121
Filed Aug. 1, 1983, Ser. No. 519,406
Term of patent 14 years
U.S. Cl. D24—51

285,005
ENVIRONMENTAL-RETREAT BOOTH
Frank Italiane, 22996 El Toro Rd., El Toro, Calif. 92630
Filed Jul. 20, 1983, Ser. No. 515,204
Term of patent 14 years
U.S. Cl. D25—16



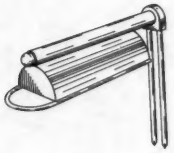
285,006
EXPANSION JOINT
Raoul M. Moulinie, Lachensie, and Guy Gagne, St. Sauveur des Montes, both of Canada, assignors to Z-Tech Enterprises Inc., Boisbriand, Canada
Filed May 23, 1983, Ser. No. 497,033
Claims priority, application Canada, Dec. 10, 1982, 10-12-82-15
Term of patent 14 years
U.S. Cl. D25—73



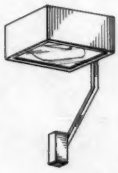
285,007
COMBINED FLUORESCENT LAMP AND ELECTRICAL ADAPTER THEREFOR
Herman J. Engel, 9832 Dungan Rd., Philadelphia, Pa. 19115
Filed Jul. 7, 1983, Ser. No. 511,771
The portion of the term of this patent subsequent to Jul. 22, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—3

285,008
NIGHTLIGHT
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Jan. 6, 1984, Ser. No. 568,981
Term of patent 14 years
U.S. Cl. D26—26

285,009
TASK LIGHT
Niels Diffrient, Ridgefield, Conn., assignor to Hauserman, Inc., Cleveland, Ohio
Filed Dec. 5, 1983, Ser. No. 558,200
Term of patent 14 years
U.S. Cl. D26—66

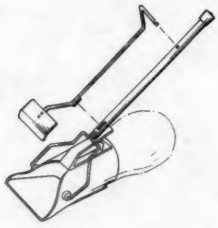


285,010
LIGHTING FIXTURE
Jack R. Mullins, Missouri City, Tex., assignor to JW Lighting, Inc., Houston, Tex.
Filed Jul. 11, 1983, Ser. No. 512,486
Term of patent 14 years
U.S. Cl. D26—67

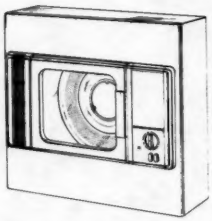


285,011
NAIL POLISH APPLICATOR
Axel Jankewitz, Furth, Fed. Rep. of Germany, assignor to A.W-.Faber-Castell GmbH & Co., Nuernberg, Fed. Rep. of Germany
Filed Apr. 30, 1984, Ser. No. 605,567
Term of patent 14 years
U.S. Cl. D28—7

285,012
REFUSE COLLECTING DEVICE
J. Don Willis, 301 E. Lawrence Rd., Phoenix, Ariz. 85012
Filed Aug. 29, 1983, Ser. No. 527,031
Term of patent 14 years
U.S. Cl. D30—99

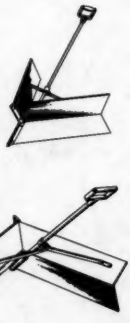


285,013
CLOTHES DRYING MACHINE
Yuji Nakamura, Inagi, and Jun Matsumoto, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Apr. 12, 1983, Ser. No. 484,241
Claims priority, application Japan, Oct. 21, 1982, 57-47582
Term of patent 14 years
U.S. Cl. D32—8

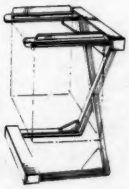


285,014
POT AND PAN SCRAPER
Ronald Maciel, 4238 Presidio Way, Napa, Calif. 94558
Filed Mar. 25, 1983, Ser. No. 478,645
Term of patent 14 years
U.S. Cl. D32—46

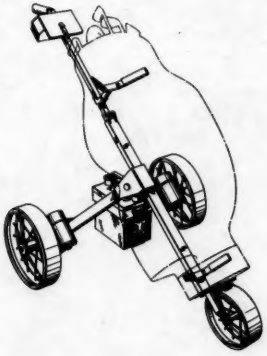
285,015
SNOW REMOVER
John L. DiAmico, 3109 Dalton Ct., Bensalem, Pa. 19020
Filed Jul. 25, 1984, Ser. No. 634,377
Term of patent 14 years
U.S. Cl. D32—49



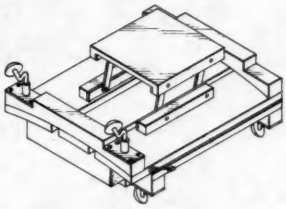
285,016
SUPPORT FOR FLEXIBLE CONTAINERS
Howard F. Claydon, 517 15th St., Boulder, Colo. 80302
Filed Nov. 26, 1984, Ser. No. 674,778
Term of patent 14 years
U.S. Cl. D34—6



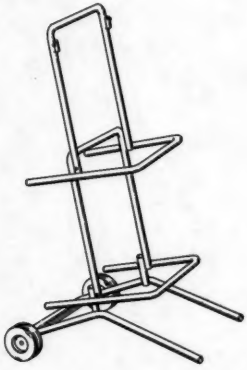
285,017
MOTOR PROPELLED GOLF CLUB CART
Ramon J. Zentis, 5533 Amoroso, Fort Myers, Fla. 33907, and Alfred A. Zentis, 8991 Main St., McKean, Pa. 16426
Filed Jun. 29, 1984, Ser. No. 626,150
Term of patent 14 years
U.S. Cl. D34—15



285,018
FOLDABLE AND CONVERTIBLE CREEPER
Silvio C. Quinonez, 355 N. Dougherty Ave., Fort Bragg, N.C. 28307
Filed Nov. 28, 1983, Ser. No. 555,521
Term of patent 14 years
U.S. Cl. D34—23



285,019
HAND TRUCK FOR DISPLAYING A PRODUCT
John J. Jackmore, St. James, N.Y., assignor to Crown Zellerbach Corporation, San Francisco, Calif.
Filed Jul. 23, 1984, Ser. No. 633,780
Term of patent 14 years
U.S. Cl. D34—26



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF AUGUST, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See—*
Leonard, Charles A.; Franko, Bernard V.; and Cale, Albert D., Jr., 4,604,388, Cl. 514-211.000.
Munson, Harry R., Jr.; and Tankersley, Robert W., Jr., 4,604,404, Cl. 514-494.000.

A. Menarini S.A.S.: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Maggi, Carlo Alberto; Roncucci, Gabrio; and Meli, Alberto, 4,604,392, Cl. 514-227.000.

A. O. Smith Harvestore Products, Inc.: *See—*
Roberts, James R., 4,604,035, Cl. 417-319.000.

A/S Kaj Neckelmann, Syntetisk Fiber Industri: *See—*
Meyer, Hans; and Hartmann, Viggo E., 4,603,562, Cl. 68-198.000.

AB Scaniainventor: *See—*
Siwersson, Olle L.; and Wall, Arne E., 4,603,774, Cl. 198-518.000.

AB Svensk Alunskifferutveckling: *See—*
Bergkvist, Bruno; Kolhi, Martti; Strandell, Erik; and Svemar, Christer, 4,604,136, Cl. 75-24.000.

AB Volvo Penta: *See—*
Brandt, Lennart H.; and Pichl, Heinz, 4,604,032, Cl. 416-128.000.

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Abbott, Curtis W., to Lucasfilm Ltd. Method and system for storing and retrieving multiple channel sampled data. 4,604,687, Cl. 364-200.000.

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Hiraoka, Shin; Asanomi, Koji; and Abe, Ryoji, 4,603,673, Cl. 123-573.000.

Abo, Keiju: *See—*
Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, 4,603,602, Cl. 74-866.000.

Ackerman, Walter T.; and Klimeck, Edward F., to Risdon Corporation. Cosmetic container construction. 4,603,989, Cl. 401-78.000.

Adachi, Yoshitugu: *See—*
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,604,411, Cl. 522-14.000.

Adams, Graham L., to International Standard Electric Corporation. Distance measurement. 4,603,972, Cl. 356-4.000.

Adaptive Micro Systems, Inc.: *See—*
Latz, William J.; Mandler, Thomas J.; and Lai, Jason C. S., 4,603,496, Cl. 40-547.000.

Adis, Erich; Bader, Manfred; and Buschulte, Winfried, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Oil gasifying burner with an oil atomizer. 4,604,104, Cl. 48-107.000.

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Hwang, Juin-Jet; McKeighan, Ronald E.; and Jaeger, Paul M., 4,603,702, Cl. 128-660.000.

AECI Limited: *See—*
Norton, John H. R.; and Rebello, Peter R., 4,603,662, Cl. 123-1.00A.

Afrashteh, Alireza: *See—*
Nesbit, Gerald H.; and Afrashteh, Alireza, 4,603,926, Cl. 339-17.00C.

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Orrhammar, Hans, 4,604,712, Cl. 364-900.000.

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Fujii, Yoshimasa; Mitsuhashi, Yoshinobu; and Koike, Osamu, 4,603,941, Cl. 350-96.150.

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Agnelli, Medardo: *See—*
Bretti, Carlo; Sermidi, Franco; and Agnelli, Medardo, 4,603,465, Cl. 29-564.600.

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Peters, Roeland H., 4,604,361, Cl. 435-288.000.

Aichelmann, Frederick J., Jr.; and Ryan, Philip M., to International Business Machines Corporation. Error logging memory system for avoiding miscorrection of triple errors. 4,604,751, Cl. 371-38.000.

Aida, Akira; Ohno, Tetsu; Fukuda, Takashi; Aihara, Kenji; Mizoguchi, Takuo; Nishimura, Syozi; and Kajiyama, Katsuyoshi, to Sumitomo Metal Industries, Ltd. Process for manufacturing high tensile steel wire. 4,604,146, Cl. 148-12.00B.

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Kunieda, Masanori; Hiramatsu, Hiromichi; Higuchi, Toshiro; and Nakagawa, Takeo, 4,603,509, Cl. 51-31.000.

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Aida, Akira; Ohno, Tetsu; Fukuda, Takashi; Aihara, Kenji; Mizoguchi, Takuo; Nishimura, Syozi; and Kajiyama, Katsuyoshi, 4,604,146, Cl. 148-12.00B.
Kanabara, Susumu; and Aihara, Kenji, 4,604,145, Cl. 148-12.00B.

Air Products and Chemicals, Inc.: *See—*
Carr, Richard V. C.; Martin, Carl J.; Gonzalez, Roland; and Albanese, Thomas A., 4,604,214, Cl. 210-759.000.

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Yamazaki, Takeo, 4,603,600, Cl. 74-503.000.

Akagi, Masanobu, to Nippon Electric Co., Ltd. Data processing system having branch instruction prefetching performance. 4,604,691, Cl. 364-200.000.

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Murakami, Kanji; Akahoshi, Haruo; Kawamoto, Mineo; Wajima, Motoyo; Matsuda, Yoichi; Kawakubo, Kyoji; Kanechiku, Minoru; Yoshimura, Toyofusa; and Matsunaga, Makoto, 4,604,160, Cl. 156-630.000.

Akai Electric Company Limited: *See—*
Onishi, Ken; Ishida, Masayuki; Shirozu, Masakazu; Takedomi, Toshikatsu; Namekawa, Makoto; and Haikawa, Yukihiko, 4,604,747, Cl. 371-37.000.

Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, to Toyota Jidosha Kabushiki Kaisha. Actuation system for transmission synchronizer providing regulated engagement pressure. 4,603,596, Cl. 74-336.00R.

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Yamanoue, Kouichi; Kitagawa, Junji; Akita, Shigeyuki; and Kuno, Akira, 4,603,581, Cl. 73-304.00C.

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Jenni, Karl, 4,603,646, Cl. 112-90.000.

Akutagawa, Susumu: *See—*
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Akutsu, Seiichi: *See—*
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Archer, Lee A., 4,603,885, Cl. 285-18.000.

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Albrecht, Hans G. Explosion type rotary turbine engine. 4,603,549, Cl. 60-39.161.

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Reeve, Martin R., 4,604,368, Cl. 501-98.000.
Sivilotti, Olivo G., 4,604,177, Cl. 204-244.000.

Aldrich, Dale J.: *See—*
Berman, Jody R.; Berkefelt, Christine C.; and Aldrich, Dale J., 4,604,317, Cl. 428-285.000.

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Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,604,190, Cl. 208-112.000.

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Alig, Roger C.: *See—*
Hernqvist, Karl G.; and Alig, Roger C., 4,604,548, Cl. 313-414.000.

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Linder, Charles; and Perry, Mordechai, 4,604,204, Cl. 210-490.000.

Allardyce, Gerald M., to RCA Corporation. Method for engaging support studs into shadow mask spring apparatus. 4,604,072, Cl. 445-30.000.

Allec, Josiane: *See—*
Grollier, Jean-Francois; and Allec, Josiane, 4,604,282, Cl. 424-74.000.

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Anderson, Kenneth K., 4,603,478, Cl. 30-276.000.

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Allied Corporation: *See—*
Fujawa, Charles S.; and Masteller, Sara B., 4,604,701, Cl. 364-431.010.
Schutzle, Gunter, 4,603,475, Cl. 29-857.000.
Thomas, Robert H., deceased; Mary A. Thomas, executrix; Hammond, Willis B.; Friedberger, Michael P.; and Archie, William A., 4,604,316, Cl. 428-265.000.

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Krengel, Theodore H., 4,603,807, Cl. 228-152.000.

Alpine Electronics, Inc.: *See—*
Onishi, Ken; Ishida, Masayuki; Shirozu, Masakazu; Takedomi, Toshikatsu; Namekawa, Makoto; and Haikawa, Yukihiko, 4,604,747, Cl. 371-37.000.

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Altmann, Hans-Peter. Shut-off valve. 4,603,708, Cl. 137-116.000.

Amaral, Leonard, to Bronx Lebanon Hospital. Method for determining bacterial sensitivity to chemical agents. 4,604,351, Cl. 435-35.000.

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Weinberg, Melvin S.; Cormier, Alan D.; and Jones, Ronald L., 4,604,166, Cl. 204-1.00T.

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Evans, Robert E.; and Hirschbuehler, Kevin R., 4,604,319, Cl. 428-290.000.

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Demerson, Christopher A.; and Humber, Leslie G., 4,604,469, Cl. 548-432.000.

American Hospital Supply Corporation: *See—*
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Amezcua, Robert; Clements, Silous F.; Coenen, John S.; DaFoe, Ralph H.; Day, Michael N.; Ross, Dennis M.; and Simpson, Richard O., to International Business Machines Corporation. System for converting data processing information to text processing format and vice versa. 4,604,710, Cl. 364-900.000.

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Dailey, Nils; Rai, Vishva; Southall, Kenneth; and Webster, Timothy J., 4,604,198, Cl. 210-198.200.

Amitay, Noach; and Gans, Michael J., to AT&T Bell Laboratories. Phased array antenna employing linear scan for wide-angle arc coverage with polarization matching. 4,604,624, Cl. 343-361.000.

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Zavelovich, Joshua; and Hacker, David S., 4,604,274, Cl. 204-157.410.

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Evans, William R., 4,603,928, Cl. 339-17.0LM.

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Analog Devices, Incorporated: *See—*
Gilbert, Barrie, 4,604,532, Cl. 307-490.000.

Analytical Bio-Chemistry Laboratories Inc.: *See—*
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Anderson, Ardis L.: *See—*
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Andersson, Helge: *See—*
Hilmersson, Anders E.; and Andersson, Helge, 4,603,490, Cl. 34-155.000.

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Androsenko, Alexandr P.: *See—*
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Aoki, Yusuke: *See—*
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Arata, Tetsuya: *See—*
Suefuji, Kazutaka; Yasuda, Hiromu; Hayashi, Masakatsu; Arata, Tetsuya; Oguni, Kensaku; Kuroda, Shigeaki; Atsumi, Akira; Ishibane, Kyuhei; Terada, Hirokiyo; Senshu, Takao; and Kogure, Hiroshi, 4,603,556, Cl. 62-180.000.

Arbed S.A.: *See—*
Schleimer, Francois; Burton, Clement; Bock, Andre ; and Peckels, Jean, 4,603,810, Cl. 239-1.000.

Arcamone, Federico: *See—*
Penco, Sergio; Arcamone, Federico; and Casazza, Anna Maria, 4,604,381, Cl. 514-34.000.

Archer, Lee A., to Akzona Incorporated. Apparatus and structure for joining pipe. 4,603,885, Cl. 285-18.000.

Archie, William A.: *See—*
Thomas, Robert H., deceased; Mary A. Thomas, executrix; Hammond, Willis B.; Friedberger, Michael P.; and Archie, William A., 4,604,316, Cl. 428-265.000.

Arco Industries: *See—*
Richards, Lawrence D.; and Yuen, Johnny S. C., 4,604,075, Cl. 446-232.000.

Arima, Teruo: *See—*
Fujii, Setsuro; Chikazawa, Nobumoto; Arima, Teruo; and Fukushima, Masakazu, 4,604,234, Cl. 514-2.000.

Armbrust, William D., to Kennametal Inc. Cutting tool assembly. 4,604,004, Cl. 407-110.000.

Armiento, Craig A.; and Norris, Peter E., to GTE Laboratories Incorporated. Fabrication of complementary modulation-doped filed effect transistors. 4,603,469, Cl. 29-571.000.

Armour Pharmaceutical Company: *See—*
Fisher, Joseph D.; and Huang, Chin C., 4,604,358, Cl. 435-217.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,604,237, Cl. 530-307.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,604,238, Cl. 530-307.000.

Armstrong, Gordon P.: *See—*
Pollet, Jean-Claude; Armstrong, Gordon P.; and Flautt, Martin C., 4,604,325, Cl. 428-391.000.

Armstrong World Industries, Inc.: *See—*
Creighton, Thomas C.; Dorsey, William C.; Lewicki, Walter J., Jr.; Long, Harry F.; and Ringer, Richard M., 4,604,312, Cl. 428-137.000.

Arnold, Dan M., to Halliburton Company. Method and apparatus for logging a borehole employing dual radiation detectors. 4,604,522, Cl. 250-264.000.

Arnott, Walter. Bowling ball. 4,603,861, Cl. 273-63.00R.

Artec Design GmbH: *See—*
Siebert, Georg, 4,603,545, Cl. 57-68.000.

Arthur G. Russell Company, Incorporated, The: *See—*
Buchas, Gerald L., 4,604,616, Cl. 340-756.000.

Asahi Glass Company Ltd.: *See—*
Miyake, Haruhisa; Suhara, Manabu; Sugaya, Yoshio; and Horie, Hirofumi, 4,604,170, Cl. 204-98.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Manabe, Seiichi; Iwata, Michitaka; and Inoue, Mamoru, 4,604,326, Cl. 428-398.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Haneishi, Yasuyuki, 4,603,955, Cl. 354-286.000.
Asan-Dzhalalov, Alexei G.: *See—*
Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., 4,604,724, Cl. 364-478.000.
Asano, Yasushi: *See—*
Tsuji, Shinsaku; Kimura, Toshimitsu; Asano, Yasushi; and Suzuki, Yasuhito, 4,603,598, Cl. 74-473.00P.
Asanomi, Koji: *See—*
Hiraoka, Shin; Asanomi, Koji; and Abe, Ryoji, 4,603,673, Cl. 123-573.000.
Ashley, Eugene, to General Electric Company. Liquid propellant weapon system. 4,603,615, Cl. 89-7.000.
Aslam, Mohammad: *See—*
Block, Eric; and Aslam, Mohammad, 4,604,480, Cl. 556-445.000.
ASM Assembly Automation, Ltd.: *See—*
Chan, Lo Kwan; and Li, Wai Sau, 4,603,803, Cl. 228-4.500.
AT&T Bell Laboratories: *See—*
Amitay, Noach; and Gans, Michael J., 4,604,624, Cl. 343-361.000.
Brown, Sanford S.; Hunsberger, Dennis J.; and Lundberg, Michael R., 4,604,500, Cl. 179-18.0ES.
Kuhl, Jane F.; and Vicory, William A., 4,604,119, Cl. 65-4.210.
Lin, Albert M., 4,604,150, Cl. 148-188.000.
AT&T Technologies, Inc.: *See—*
Becker, Alan R.; McCorkle, Richard A.; Miller, Robert A.; and Plessl, Gary J., 4,604,027, Cl. 414-749.000.
Wong, Ching-Ping, 4,604,144, Cl. 134-28.000.
Atalar, Abdullah, to Ernst Leitz Wetzlar GmbH. Method for representing elastic parameters of object surfaces. 4,603,585, Cl. 73-606.000.
Athena Controls Inc.: *See—*
Metz, Bruce E., 4,604,516, Cl. 219-379.000.
Atkins, Richard R. Safety attachment for a table saw. 4,603,612, Cl. 83-425.000.
Atlantic Richfield Company: *See—*
Younes, Usama E., 4,604,422, Cl. 524-502.000.
Atsumi, Akira: *See—*
Suefuji, Kazutaka; Yasuda, Hiromu; Hayashi, Masakatsu; Arata, Tetsuya; Oguni, Kensaku; Kuroda, Shigeaki; Atsumi, Akira; Ishibane, Kyuhei; Terada, Hirokiyo; Senshu, Takao; and Kogure, Hiroshi, 4,603,556, Cl. 62-180.000.
Aurichio, Joseph A.: *See—*
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Auscilla Plastics, Inc.: *See—*
Dittrich, Patrick E., 4,603,982, Cl. 384-129.000.
Austel, Volkhard: *See—*
Reiffen, Manfred; Noll, Klaus; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,604,389, Cl. 514-213.000.
Avco Corporation: *See—*
Boudreau, Jon P., 4,603,635, Cl. 102-206.000.
Avon Inflatables Limited: *See—*
Harding, Richard J. A., 4,603,651, Cl. 114-345.000.
Axe, John R.: *See—*
Chen, Gilbert; Kitterman, B. Layton; Glaspie, Donald L.; and Axe, John R., 4,604,247, Cl. 261-94.000.
Ayers, William R., to Central Illinois Manufacturing Company. Water removing filter media. 4,604,205, Cl. 210-497.200.
Ayerst, McKenna & Harrison, Inc.: *See—*
Bellini, Francesco; and Sestanj, Kazimir, 4,604,406, Cl. 514-562.000.
Ayoub, Peter, to United States of America, Navy. Airspeed sensing pressure valve system. 4,603,823, Cl. 244-122.0AE.
Azuma, Kazufumi: *See—*
Tanaka, Masahiro; Azuma, Kazufumi; Nate, Kazuo; and Nakatani, Mitsuo, 4,604,294, Cl. 427-53.100.
Babb, Richard R.; and Kirschler, Howard A., to Motorola, Inc. Spinner chuck. 4,603,867, Cl. 279-3.000.
Babcock & Wilcox Company, The: *See—*
Sterling, Edward L., Jr.; and Bastijanic, Edward, 4,604,566, Cl. 323-275.000.
Bach, Bert; and Bach, David. Grain chute system. 4,603,769, Cl. 193-12.000.
Bach, David: *See—*
Bach, Bert; and Bach, David, 4,603,769, Cl. 193-12.000.
Bach, Stanley M., Jr.: *See—*
Speicher, Vernon L.; and Bach, Stanley M., Jr., 4,603,705, Cl. 128-786.000.
Bader, Manfred: *See—*
Adis, Erich; Bader, Manfred; and Buschulte, Winfried, 4,604,104, Cl. 48-107.000.
Baeger, Holm; and Preiss, Bernd, to VDO Adolf Schindling AG. Indicating device having spacer element distribution to compensate for expansion. 4,603,947, Cl. 350-344.000.
Bak, Michael J.: *See—*
Pfefferle, William C.; and Bak, Michael J., 4,603,547, Cl. 60-39.020.
Baker, Richard W., to Pako Corporation. Film-width and transmittance scanner system. 4,603,956, Cl. 354-298.000.
Baker, Robert W.; Donely, Dean; and Odorcic, Vlado, to Hennick, Nathan I. Swimming pool alarm. 4,604,610, Cl. 340-566.000.
Balibali System Co., Ltd.: *See—*
Kazuo, Ozawa; and Saburo, Yoinara, 4,603,684, Cl. 126-299.00R.
Ballinger, Dale O.; Chynoweth, William R.; and Wade, Gerald J., to Honeywell Inc. Magnetostrictive record head. 4,604,669, Cl. 360-113.000.
Banks, Bruce A.: *See—*
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., 4,604,181, Cl. 204-298.000.
Barabino, William A.: *See—*
Dean, Raymond S.; and Barabino, William A., 4,604,096, Cl. 604-385.00A.
Barbieri, Raul; and Marianelli, Giorgio. Paper sheet carrying board provided with clip and closable seat for containing writing articles. 4,603,883, Cl. 281-45.000.
Barfield, Kenneth E. Single lens goggle. 4,603,442, Cl. 2-447.000.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Hertell, Siegfried; and Lange, Robert, 4,604,041, Cl. 418-82.000.
Barny, Jean J.; and Roch, Roger, to Bobst SA. Machine for manufacturing folded boxes. 4,604,083, Cl. 493-34.000.
Barrault, Michel R., to Merlin Gerin. Electromagnetic delay line incorporated in a position detector for a movable nuclear reactor control rod. 4,604,576, Cl. 324-208.000.
Barrett, Keith, to Dart Industries Inc. Telescoping parts manipulator. 4,604,026, Cl. 414-728.000.
Barry, Michael N., to Westinghouse Electric Corp. Pulse frequency modulation control for a heater. 4,604,517, Cl. 219-494.000.
Barsellotti, John A., to Mitel Corporation. Voice and data interface circuit. 4,604,741, Cl. 370-69.100.
Barski, Guy, to CII Honeywell Bull. Magnetic disc cartridge with centering structure. 4,604,664, Cl. 360-97.000.
Barth, Alois; and Wiemann, Lothar, to Mahle GmbH. Multi-part plunger piston for internal combustion engines. 4,603,617, Cl. 92-216.000.
Bartholomew, James C.: *See—*
Moroney, William F.; Bartholomew, James C.; Cagle, Clifford M.; and Hughes, Robert E., 4,603,486, Cl. 33-512.000.
Bartle, Peter M.; and Needham, James C., to Welding Institute, The. Acoustic detection of defects in structures. 4,603,584, Cl. 73-599.000.
Bartlett, Philip L., to Du Pont de Nemours, E. I., and Company. Aerosol corrosion inhibitors. 4,604,226, Cl. 252-389.00A.
BASF Aktiengesellschaft: *See—*
Ammermann, Eberhard; Buschmann, Ernst; Ley, Gregor; and Pommer, Ernst-Heinrich, 4,604,429, Cl. 525-326.600.
Hambrecht, Juergen; Illers, Karl-Heinz; Echte, Adolf; and Swoboda, Johann, 4,604,415, Cl. 524-140.000.
Neumann, Peter; Thomas, Michael; Weiss, Stefan; and Trauth, Hubert, 4,604,471, Cl. 549-210.000.
Schott, Eberhard P.; Fischer, Volker; Jung, Johann; and Rosebrock, Henning, 4,604,129, Cl. 71-76.000.
Bastijanic, Edward: *See—*
Sterling, Edward L., Jr.; and Bastijanic, Edward, 4,604,566, Cl. 323-275.000.
Battelle Development Corporation: *See—*
DeFord, Henry S.; and Moss, Owen R., 4,603,794, Cl. 222-207.000.
Battson, Donald F.: *See—*
Elabd, Hammam; Kosonocky, Walter F.; and Battson, Donald F., 4,604,652, Cl. 358-213.000.
Bauer Kaba AG: *See—*
Kleinhany, Arno; and Gutmann, Walter, 4,603,564, Cl. 70-277.000.
Baumgartner, Hans; Brandstadter, Manfred; and Sudbeck, Rainer, to Pierburg GmbH & Co., KG. Displacement machine having a housing and piston with spiral walls. 4,604,040, Cl. 418-55.000.
Baxter Travenol Laboratories, Inc.: *See—*
de la Poype, Roland, 4,603,536, Cl. 53-410.000.
Duffy, Joseph K.; Thoene, Mark L.; and Combs, Cathy M., 4,603,780, Cl. 206-591.000.
Bayer Aktiengesellschaft: *See—*
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Oberkirch, Wolfgang; de Montigny, Armand; and Botsch, Hansjurgen, 4,603,738, Cl. 166-275.000.
BBC Brown, Boveri & Company Limited: *See—*
Gobrecht, Jens; and Schuler, Claus, 4,603,474, Cl. 29-597.000.
Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research and Engineering Co. Hydrocracking with chromic acid and an aliphatic polyhydroxy compound. 4,604,190, Cl. 208-112.000.
Beaver, Richard N.: *See—*
Morris, Gregory J. E.; Pimlott, John R.; Beaver, Richard N.; Dang, Hiep D.; and Grosshandler, Sandor, 4,604,171, Cl. 204-98.000.
Bechu, Jean-Pierre, to Caoutchouc Manufacture et Plastiques. Rubber mount with elastic control. 4,603,843, Cl. 267-35.000.
Beck, Rainer; and Schulte, Alfons, to Eugen Beck, KG. Spectacle frame with securing band. 4,603,951, Cl. 351-156.000.
Beck, Reinhold. Fat frier. 4,603,622, Cl. 99-331.000.
Becker, Alan R.; McCorkle, Richard A.; Miller, Robert A.; and Plessl, Gary J., to AT&T Technologies, Inc. Manipulator of articles and methods of moving articles over an extended distance. 4,604,027, Cl. 414-749.000.
Beckham, Keith F.; Kolman, Anne E.; McGuire, Kathleen M.; Puttlitz, Karl J.; and Quinones, Horatio, to International Business Machines Corporation. Solder interconnection structure for joining semiconductor devices to substrates that have improved fatigue life, and process for making. 4,604,644, Cl. 357-80.000.
Beecham Group p.l.c.: *See—*
Smith, Richard A.; and Cassels, Robert, 4,604,285, Cl. 424-94.000.
Beer, Carl C., to Sherman Industries, Inc. Disk type brush. 4,603,447, Cl. 15-97.00B.

Belew, Robert R., to United States of America, National Aeronautics and Space Administration. Remotely operable peristaltic pump. 4,604,038, Cl. 417-475.000.

Bell Communications Research, Inc.: *See*—
Tarascon, Jean-Marie, 4,604,334, Cl. 429-194.000.

Bell, Eugene; and Dubertret, Louis, to Massachusetts Institute of Technology. Skin-equivalent prepared by the use of punch biopsy. 4,604,346, Cl. 435-1.000.

Bell, John M.; and Schmidt, Peter J., to Northern Telecom Limited. Electrical conductor for telecommunications cable. 4,604,497, Cl. 174-110.00F.

Bellini, Francesco; and Sestanj, Kazimir, to Ayerst, McKenna & Harrison, Inc. N-[6-methoxy-5-(perfluoroalkyl)-1-naphtholyl]-N-methylglycines and their thionaphthoyl analogs. 4,604,406, Cl. 514-562.000.

Benedicktus, Jon J.: *See*—
Katz, Edward; Benedicktus, Jon J.; Knarr, Edward L.; and Scallet, Barrett L., 4,604,354, Cl. 435-94.000.

Benko, Eva; Csabanko, Istvan; Porkolab, Aniko ; Szabo, Zsolt; and Takacs, Gabor, to "Labor" Muszeripari Muvek. Multifunction centrifuge. 4,604,086, Cl. 494-16.000.

Benn, George; Frost, Wendell; Knudsen, Chris; and Nieuwsma, David, to Sundstrand Data Control, Inc. Aircraft flight data display system. 4,604,711, Cl. 364-900.000.

Bennett, James L.; and Pax, Ralph A., to Research Corporation. Micromotility meter. 4,603,977, Cl. 356-436.000.

Berendt, Hans-Ulrich; and Schafer, Paul, to Ciba-Geigy Corporation. Process for printing cellulose-containing textile material with foam-containing reactive dyes and addition of (meth) acrylamide polymers. 4,604,099, Cl. 8-477.000.

Berg, James I., to Owens-Corning Fiberglas Corporation. Methods of measuring temperature and electrical resistivity in a molten glass stream. 4,603,980, Cl. 374-179.000.

Berge, Jacques. Watercraft with at least two twin hulls. 4,603,648, Cl. 114-39.000.

Berger, Johann: *See*—
Berger, Josef; and Berger, Johann, 4,603,561, Cl. 66-203.000.

Berger, Josef; and Berger, Johann. Crochet tools for producing strips on a crochet galloon machine. 4,603,561, Cl. 66-203.000.

Bergevin, Benoit: *See*—
Jean, Benoit; Bergevin, Benoit; and Rheault, Fernand, 4,603,685, Cl. 126-433.000.

Berggreen, Arthur C.: *See*—
Russ, Roger R.; and Berggreen, Arthur C., 4,604,683, Cl. 364-200.000.

Bergh, Ralph A.: *See*—
Shaw, Herbert J.; Digonnet, Michel J. F.; Bergh, Ralph A.; Sorin, Wayne V.; and Kolner, Brian H., 4,603,940, Cl. 350-96.150.

Bergkvist, Bruno; Kolhi, Martti; Strandell, Erik; and Svemar, Christer, to AB Svensk Alunskifferutveckling. Method and an apparatus for subdivision of and heat recovery from a liquid slag. 4,604,136, Cl. 75-24.000.

Bergler, Otto, to Black & Decker Overseas AG. Guide means for manual planing tools. 4,603,479, Cl. 30-475.000.

Berkefelt, Christine C.: *See*—
Berman, Jody R.; Berkefelt, Christine C.; and Aldrich, Dale J., 4,604,317, Cl. 428-285.000.

Berman, Ellen M.: *See*—
Elslager, Edward F.; Werbel, Leslie M.; Ortwine, Daniel F.; Worth, Donald F.; Showalter, Howard D. H.; Capps, David B.; Berman, Ellen M.; Gregor, Vlad E.; and Sercel, Anthony D., 4,604,390, Cl. 514-222.000.

Berman, Jody R.; Berkefelt, Christine C.; and Aldrich, Dale J., to Dow Chemical Company, The. Curable compositions containing a polyepoxide and a halogenated bisphenol. 4,604,317, Cl. 428-285.000.

Bernardi, Richard B.: *See*—
Luthra, Ajay K.; Kassam, Saleem; and Bernardi, Richard B., 4,604,697, Cl. 364-414.000.

Bernd-Holger, Rohling, to Lucas Industries public limited company. Floating caliper type disc brake. 4,603,761, Cl. 188-73.450.

Bertling, Hannes: *See*—
Leiber, Heinz; and Bertling, Hannes, 4,603,918, Cl. 303-6.00R.

Bertotto, Serafino, to Industrie Tessili Bresciane S.P.A. Endless belts for battery pasting machines and method for manufacturing the same. 4,604,310, Cl. 428-36.000.

Bertram, Leo; and Bukoschek, Romuald L., to U.S. Philips Corporation. Drive mechanism with a rotary drive motor. 4,604,539, Cl. 310-80.000.

Bertsch, Richard; Gunther, Dieter; Schnurle, Hans; and Steinbrenner, Ulrich, to Robert Bosch GmbH. Method of and device for lambda-regulation of fuel mixture for an internal combustion engine. 4,603,670, Cl. 123-440.000.

BETAX Gesellschaft fur Beratung und Entwicklung technischer Anlagen mbH: *See*—
Tax, Hans; and Kurz, Herbert, 4,603,783, Cl. 212-132.000.

Beuhler, Allyson J.; and Wrezel, James A., to UOP Inc. High temperature thermoset terpolymers. 4,604,438, Cl. 526-262.000.

Bews, Andrew M., to United Wire Group. Marine antifouling materials and markers. 4,603,653, Cl. 116-209.000.

Bien, Paul R., to General Motors Corporation. Drive motor gear lubricant seal for locomotives and the like. 4,603,865, Cl. 277-12.000.

Bilco Company, The: *See*—
Lyons, George W., Jr., 4,603,517, Cl. 52-60.000.

Binnaka, Toshio: *See*—
Horiuchi, Akinori; Binnaka, Toshio; and Maruyama, Shigeyuki, 4,604,572, Cl. 324-158.00F.

Bird, Graham J.: *See*—
Watson, Keith G.; Wishart, John D.; Farquharson, Graeme J.; Bird, Graham J.; and Cross, Lindsay E., 4,604,128, Cl. 71-88.000.

Birkadze, Dzhemal I.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Biziere, Kathleen; Chambon, Jean-Pierre; and Molimard, Jean-Charles, to Societe Anonyme Styled: SANOFI. Pyrrolidin-2-ones and medicaments containing them. 4,604,383, Cl. 514-63.000.

BJ-Titan Services Company: *See*—
Dawson, Jeffrey C., 4,604,218, Cl. 252-8.55C.

Bjorn, Tord. Boat, the bottom of which is provided with a plurality of downwardly opening channels. 4,603,650, Cl. 114-288.000.

Black & Decker Overseas AG: *See*—
Bergler, Otto, 4,603,479, Cl. 30-475.000.

Black, John B., to New Pro Technology, Inc. Down the hole reverse up flow jet pump. 4,603,735, Cl. 166-68.000.

Black, John W., to Standex International Corporation. Mold mounting and releasable clamp therefor. 4,604,045, Cl. 425-575.000.

Blake, Robert C., II, to Miles Laboratories, Inc. Purification of flavin adenine dinucleotide synthetase. 4,604,356, Cl. 435-194.000.

Blanchard, Kenneth L.: *See*—
Smith, Ronald A.; Jackson, James M.; Lehfeldt, Carl L.; Cygnarowicz, Leonard P.; Moshfegh, Khosro; Blanchard, Kenneth L.; and Nelson, Kenneth J., 4,603,567, Cl. 72-8.000.

Block, Eric; and Aslam, Mohammad, to Research Foundation of State University of New York, The. Method for the preparation of sulfones and compounds containing carbon chains having conjugated unsaturation and the compounds resulting from such method. 4,604,480, Cl. 556-445.000.

Blond, Marcel, to Valeo. Clutch plate having two stage torsion damping means. 4,603,767, Cl. 192-106.200.

Bloomfield Industries, Inc.: *See*—
Roberts, Melvin F., 4,603,621, Cl. 99-307.000.

Blount, Frederick T.; Capowski, Robert S.; Casper, Daniel F.; DelSonno, Lawrence R.; Geller, Robert F.; Kusmiss, Joseph M.; and Zimmerman, Terrence K., to International Business Machines Corp. Channel communicator. 4,604,709, Cl. 364-900.000.

Blower Application Company: *See*—
Panning, Martin H., 4,603,816, Cl. 241-266.000.

Blum, Arnold, to International Business Machines Corporation. Testing and diagnostic device for digital computers. 4,604,746, Cl. 371-25.000.

Blume, R. J. Carter: *See*—
Reiter, Bernadette G.; Castor, John W.; Blume, R. J. Carter; Schewe, Roy A.; and Shepley, Leonard D., 4,604,686, Cl. 364-200.000.

Board of Governors for Higher Education, State of Rhode Island and Providence Plantations: *See*—
Rahn, Kenneth A.; and Lowenthal, Douglas H., 4,603,575, Cl. 73-28.000.

Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Franz-Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, to Jean Walterscheid GmbH. Shaft connection mechanism. 4,603,998, Cl. 403-322.000.

Bobrick Washroom Equipment, Inc.: *See*—
Greenberg, Robert, 4,603,827, Cl. 248-542.000.

Bobst SA: *See*—
Barny, Jean J.; and Roch, Roger, 4,604,083, Cl. 493-34.000.

BOC Group, Inc., The: *See*—
Nichols, Robert A.; and Tobler, David R., 4,603,700, Cl. 128-633.000.

Bocharov, Jury A.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Bock, Andre : *See*—
Schleimer, Francois; Burton, Clement; Bock, Andre ; and Peckels, Jean, 4,603,810, Cl. 239-1.000.

Bocko, Peter L.; Wein, William J.; and Young, Charles E., to Corning Glass Works. Method for synthesizing MgO—Al_2O_3—SiO_2 glasses and ceramics. 4,604,118, Cl. 65-3.120.

Boehm, Douglas A.; and Ylinen, David M., to Motorola, Inc. Portable demonstrator for electronic equipment. 4,604,064, Cl. 434-224.000.

Boehm, Terrence E. Tree transporter. 4,604,017, Cl. 414-23.000.

Boel.ringer Ingelheim International GmbH: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muaceic, Gojko, 4,604,468, Cl. 548-305.000.

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Chee, Wan T., 4,603,822, Cl. 244-54.000.
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Pinson, George T., 4,604,592, Cl. 333-24.100.
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Moscovitch, Jerry N., 4,603,903, Cl. 297-250.000.

Borcherdt, Roger D.; Fletcher, Jon P.; Warrick, Richard E.; Maxwell, Gary L.; Jensen, Edward G.; and Schaack, John V., to United States of America, Interior. General earthquake observation system. 4,604,699, Cl. 364-420.000.

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Boucherie, Leonel P., to G.B. Boucherie, Firma. Brush manufacturing machine. 4,603,912, Cl. 300-2.000.

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Gile, Richard H.; and Bourgoine, Edward C., 4,603,677, Cl. 125-11.00R.

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Staplin, Theodore R., Jr.; Bradley, John J.; and Stoffers, Brian L., 4,604,722, Cl. 364-736.000.
Widen, Melinda A.; Bradley, John J.; and O'Har, George M., 4,604,695, Cl. 364-200.000.

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Brandt, Lennart H.; and Pichl, Heinz, to AB Volvo Penta. Rotor device. 4,604,032, Cl. 416-128.000.

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Callewaert, Denis M.; and Braxton, Earl J., 4,604,357, Cl. 435-215.000.

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Brenk, Fritz, to Timex Corporation. Laminated base element for a wristwatch using hot melt adhesive foil. 4,603,978, Cl. 368-317.000.

Bretti, Carlo; Sermidi, Franco; and Agnelli, Medardo, to Eurosab S.R.L. Machine for marking electric wires. 4,603,465, Cl. 29-564.600.

Brickman, Harold. Foldable table having storage capabilities. 4,603,642, Cl. 108-25.000.

Bridgestone Tire Company: *See*—
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, 4,603,722, Cl. 152-209.00R.

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Johnson, Porter C., 4,604,430, Cl. 525-326.700.

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Mayer, Rayner M., 4,603,555, Cl. 60-721.000.

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Amaral, Leonard, 4,604,351, Cl. 435-35.000.

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Damiron, Pierre M.; Legoupil, Jean-Luc; and Brosson, Jacques, 4,604,157, Cl. 156-345.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Funahashi, Yasuhiro, 4,604,615, Cl. 340-750.000.

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Fiegener, Dale R.; and Broussard, Felix J., 4,604,178, Cl. 204-286.000.

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Brown, Roy, to Graphoidal Developments Limited. Method and apparatus for lubricating and moulding glass parisons. 4,604,120, Cl. 65-26.000.

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Brownstein, Scott A., to Eastman Kodak Company. Film video player/printer with cropping control. 4,603,966, Cl. 355-45.000.

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Bruckert, William F.: *See*—
Manton, John C.; Bruckert, William F.; and Dellicicchi, Alfred J., 4,604,750, Cl. 371-38.000.

Brunelli, Timothy A.: *See*—
Cheresnowsky, Michael J.; Brunelli, Timothy A.; Munn, Robin W.; and Kim, Tai K., 4,604,266, Cl. 423-54.000.

Brunssen, Johann: *See*—
Koch, Klaus D.; Brunssen, Johann; and Sieling, Helmut, 4,603,492, Cl. 34-237.000.

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Hesterberg, William G.; Donahue, Raymond J.; and Sheaffer, Benjamin L., 4,603,665, Cl. 123-195.00R.

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Bukoschek, Romuald L.: *See*—
Bertram, Leo; and Bukoschek, Romuald L., 4,604,539, Cl. 310-80.000.

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Haglund, John H., 4,604,754, Cl. 373-130.000.

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Daugherty, Donald L., 4,603,620, Cl. 99-300.000.

Burger, John P., to Convergent Technologies, Inc. Bus repeater. 4,604,689, Cl. 364-200.000.

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Gerber, Dennis H., 4,603,790, Cl. 220-219.000.

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Burr, Edward A.: *See*—
Shaum, Richard L.; and Burr, Edward A., 4,603,579, Cl. 73-186.000.

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Webler, Thomas N.; and Lacher, William A., 4,604,588, Cl. 331-135.000.

Burrows, James L., to Sanders Associates, Inc. Bit-slice adder circuit. 4,604,723, Cl. 364-786.000.

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Burton, David. Lotto ticket marking guide. 4,603,884, Cl. 283-1.00A.

Busch Industrial Products Corporation: *See*—
Katz, Edward; Benedicktus, Jon J.; Knarr, Edward L.; and Scallet, Barrett L., 4,604,354, Cl. 435-94.000.

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Buschmann, Ernst: *See*—
Ammermann, Eberhard; Buschmann, Ernst; Ley, Gregor; and Pommer, Ernst-Heinrich, 4,604,429, Cl. 525-326.600.

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Adis, Erich; Bader, Manfred; and Buschulte, Winfried, 4,604,104, Cl. 48-107.000.

Buthe, Theo: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Franz-Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,603,998, Cl. 403-322.000.

Byers, Stuart D.; and Clark, John F., to Crophandling Systems Limited. Storage vessel. 4,603,525, Cl. 52-245.000.

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Moroney, William F.; Bartholomew, James C.; Cagle, Clifford M.; and Hughes, Robert E., 4,603,486, Cl. 33-512.000.

Calderon, Albert. Apparatus for processing bulk materials by induction. 4,604,165, Cl. 202-113.000.

Cale, Albert D., Jr.: *See*—
Leonard, Charles A.; Franko, Bernard V.; and Cale, Albert D., Jr., 4,604,388, Cl. 514-211.000.

Calgon Corporation: *See*—
Jakubowski, John A., 4,604,405, Cl. 514-526.000.
Matz, Gary F., 4,604,212, Cl. 210-700.000.

Callahan, James F.; Huffman, William F.; Moore, Michael L.; and Yim, Nelson C., to SmithKline Beckman Corporation. Basic V_1-vasopressin antagonists. 4,604,378, Cl. 514-11.000.

Callewaert, Denis M.; and Braxton, Earl J., to Enzymes of America. Antimicrobial disinfecting urinal block means and methods of use. 4,604,357, Cl. 435-215.000.

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Knowles, William R.; and Cruttwell, Ian A., 4,604,523, Cl. 250-310.000.

Campbell, Curtis B., to Chevron Research Company. Deposit control additives—polyether polyamine ethanes. 4,604,103, Cl. 44-72.000.

Campbell, Michael J.: *See*—
McCall, Clyde A.; Campbell, Michael J.; and Dean, William B., 4,604,315, Cl. 428-230.000.

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Mackenzie, Peter B., 4,604,055, Cl. 432-58.000.

Canada Cup, Inc.: *See*—
Valyi, Emery I., 4,604,258, Cl. 264-537.000.

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Amemiya, Mitsuaki, 4,604,345, Cl. 430-394.000.
Egawa, Akira; and Kodaira, Takanori, 4,603,954, Cl. 354-137.000.
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Boughton, Matthew S.; and La Plante, Mark T., 4,603,875, Cl. 280-272.000.

Caoutchouc Manufacture et Plastiques: *See*—
Bechu, Jean-Pierre, 4,603,843, Cl. 267-35.000.

Capjack, Clarence E.: *See*—
Sequin, Herb J. J.; Nam, Kyong H.; and Capjack, Clarence E., 4,604,752, Cl. 372-29.000.

Capowski, Robert S.: *See*—
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Elslager, Edward F.; Werbel, Leslie M.; Ortwine, Daniel F.; Worth, Donald F.; Showalter, Howard D. H.; Capps, David B.; Berman, Ellen M.; Gregor, Vlad E.; and Sercel, Anthony D., 4,604,390, Cl. 514-222.000.

Carello Industriale, S.p.A.: *See*—
Rolando, Giovanni; and Manunta, Giorgio, 4,604,679, Cl. 362-277.000.

Carle & Montanari S.p.A.: *See*—
Ripani, Sergio; and Serafini, Giulio, 4,603,815, Cl. 241-36.000.

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Dempsey, Daniel J.; and Parker, Kent L., 4,603,680, Cl. 126-99.00A.

Carrington, Charles R.: *See*—
Fisher, Carl, Jr.; Carrington, Charles R.; and Grant, George A., 4,604,706, Cl. 364-507.000.

Carter, Mark L.: *See*—
Edwards, Jon L.; and Carter, Mark L., 4,603,740, Cl. 166-319.000.

Caruso, Richard. Hair curler. 4,603,706, Cl. 132-41.000.

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Penco, Sergio; Arcamone, Federico; and Casazza, Anna Maria, 4,604,381, Cl. 514-34.000.

Casper, Daniel F.: *See*—
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Smith, Richard A.; and Cassels, Robert, 4,604,285, Cl. 424-94.000.

Castor, John W.: *See*—
Reiter, Bernadette G.; Castor, John W.; Blume, R. J. Carter; Schewe, Roy A.; and Shepley, Leonard D., 4,604,686, Cl. 364-200.000.

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Pflederer, Mark R., 4,604,675, Cl. 361-155.000.

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Shimp, David A., 4,604,452, Cl. 528-422.000.

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Ayers, William R., 4,604,205, Cl. 210-497.200.

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Wichterle, Otto; Trekoval, Jiri; Vacik, Jiri; and Michalek, Jiri, 4,604,440, Cl. 526-327.000.

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Biziere, Kathleen; Chambon, Jean-Pierre; and Molimard, Jean-Charles, 4,604,383, Cl. 514-63.000.

Chan, Lo Kwan; and Li, Wai Sau, to ASM Assembly Automation, Ltd. Wire bonding apparatus. 4,603,803, Cl. 228-4.500.

Chang, Wei C. Nursing bottle system. 4,603,784, Cl. 215-11.00R.

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Chang, Yu-Wen; Kan, Phillip T.; and Ross, Oakley G., to General Dynamics, Pomona Division. Flexible, dielectric millimeter waveguide. 4,603,942, Cl. 350-96.240.

Channellock, Inc.: *See*—
Schaffner, Bernard P., Jr., 4,603,607, Cl. 81-414.000.

Channing, Harry: *See*—
Windisch, Lawrence; Nees, John; and Channing, Harry, 4,604,564, Cl. 320-2.000.

Chardonol Corporation: *See*—
Altenberg, Milton J., 4,604,410, Cl. 521-172.000.

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Deckner, George E.; Mercado, Clara G.; and Krog, Ann M., 4,604,281, Cl. 424-59.000.

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Dozer, Charles S., 4,603,638, Cl. 104-95.000.

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Chen, Gilbert; Kitterman, B. Layton; Glaspie, Donald L.; and Axe, John R., to Glitsch, Inc. Tower packing material and method. 4,604,247, Cl. 261-94.000.

Chen, James N., to Hewlett-Packard Company. Stand-off device with special fluid. 4,603,701, Cl. 128-660.000.

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Chetty, P. R. K., to Sundstrand Corporation. Maximum power transfer system for a solar cell array. 4,604,567, Cl. 323-299.000.

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Lalancette, Jean M.; Chevalier-Bultel, Jean P.; and Desrosiers, Luc, 4,604,140, Cl. 106-38.900.

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Campbell, Curtis B., 4,604,103, Cl. 44-72.000.

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Chianelli, Russell R.: *See—*
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Chiba, Toshiyuki: *See—*
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Chicopee: *See—*
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Chipman, Max C.; and Horton, George R. Spring exercise device. 4,603,857, Cl. 272-136.000.

Cho, Tsuneo: *See—*
Ikada, Yoshito; Gen, Shokyu; Shimizu, Yasuhiko; Tamura, Koichi; Nakamura, Tatsuo; Kimura, Sosuke; Cho, Tsuneo; Tadokoro, Hideki; and Hori, Kazuaki, 4,603,695, Cl. 128-334.00R.

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Putman, Richard E.; Gundersen, Katherine A.; and Christenson, James C., 4,604,714, Cl. 364-494.000.

Christianson, Tony. Inlet valve for breathing apparatus second stage regulators. 4,603,833, Cl. 251-94.000.

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Dalal, Vikram L., 4,604,636, Cl. 357-2.000.

Chrysler Corporation: *See—*
Cuevas-Cumming, Pablo, 4,603,925, Cl. 312-196.000.

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Ballinger, Dale O.; Chynoweth, William R.; and Wade, Gerald J., 4,604,669, Cl. 360-113.000.

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Berendt, Hans-Ulrich; and Schafer, Paul, 4,604,099, Cl. 8-477.000.
Hutchison, Alan J., 4,604,397, Cl. 514-291.000.
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Renner, Alfred, 4,604,437, Cl. 526-262.000.
Schneider, Dieter; Knies, Heinz; and Kaudela, Gerhard, 4,604,100, Cl. 8-526.000.

CII Honeywell Bull: *See—*
Barski, Guy, 4,604,664, Cl. 360-97.000.

Ciliberti, David F.; and Lippert, Thomas E., to Westinghouse Electric Corp. Electrostatic precipitator with readily cleanable collecting electrode. 4,604,112, Cl. 55-117.000.

Cincinnati Microwave, Inc.: *See—*
Grimsley, Richrd L.; and Furnish, Gregory R., 4,604,529, Cl. 307-10.00R.

Cincinnati Milacron Inc.: *See—*
Bone, Kendall F., 4,604,008, Cl. 409-231.000.

Cinzori, Robert J., to Hughes Aircraft Company. Apparatus and method for nighttime and low visibility alignment of communicators. 4,603,975, Cl. 356-152.000.

Clancy, Kevin F.; and Schneider, Ralph J., to Honeywell Inc. Elastomeric push button return element for providing enhanced tactile feedback. 4,604,509, Cl. 200-159.00B.

Clark, Bruce D., to G. W. Lisk Company, Inc. Solenoid construction and method for making the same. 4,604,600, Cl. 335-261.000.

Clark, Danford E., to Union Oil Company of California. Hydrocracking catalyst of improved activity. 4,604,373, Cl. 502-65.000.

Clark, Earl: *See—*
Irvin, Howard B.; Stahl, G. Allan; and Clark, Earl, 4,604,216, Cl. 252-8.510.

Clark, John F.: *See—*
Byers, Stuart D.; and Clark, John F., 4,603,525, Cl. 52-245.000.

Clark, Thomas F., to Phoenix Electric Corporation. Status-indicating current interrupter. 4,604,613, Cl. 340-638.000.

Clawson, Lawrence G., to Raytheon Company. Condensing furnace with corrosion suppression. 4,603,681, Cl. 126-110.00R.

Clecim: *See—*
Damiron, Pierre M.; Legoupil, Jean-Luc; and Brosson, Jacques, 4,604,157, Cl. 156-345.000.

Clegg, John E. Synchronized scotch yoke. 4,603,593, Cl. 74-50.000.

Clegg, John E. Wall-mounted conical beam concentrator. 4,603,686, Cl. 126-440.000.

Clegg, John E. Revolving magnifying prisms. 4,603,939, Cl. 350-6.400.

Clegg, John E. Conical beam concentrator. 4,603,949, Cl. 350-432.000.

Clements, Silous F.: *See—*
Amezcua, Robert; Clements, Silous F.; Coenen, John S.; DaFoe, Ralph H.; Day, Michael N.; Ross, Dennis M.; and Simpson, Richard O., 4,604,710, Cl. 364-900.000.

Clutterbuck, Richard C. D.; and Painton, Anthony R., to EMI Limited. Timing circuits. 4,604,536, Cl. 307-603.000.

CMR Enterprises, Inc.: *See—*
Davidson, Mel, 4,604,515, Cl. 219-298.000.

Codman & Shurtleff, Inc.: *See—*
Santangelo, John A.; and Worrick, Charles B., III, 4,604,089, Cl. 604-30.000.

Coenen, John S.: *See—*
Amezcua, Robert; Clements, Silous F.; Coenen, John S.; DaFoe, Ralph H.; Day, Michael N.; Ross, Dennis M.; and Simpson, Richard O., 4,604,710, Cl. 364-900.000.

Coenen, Karl: *See—*
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Franz-Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,603,998, Cl. 403-322.000.

Cohen, Donald K., to International Business Machines Corporation. Optical focus detection employing rotated interference patterns. 4,604,739, Cl. 369-45.000.

Cohen, Howard; and Dauer, Alois, to Irwin Measuring Tool Co. Bumper indicator. 4,603,481, Cl. 33-138.000.

Cole-Hamilton, David J.; Jones, Anthony C.; and Mullin, John B., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Preparation of metal alkyls. 4,604,473, Cl. 556-1.000.

Cole, Richard L.; and Janik, Gloria, to Dow Corning Corporation. Thermally conductive polyorganosiloxane elastomer composition. 4,604,424, Cl. 524-862.000.

Colgate Palmolive Co.: *See—*
Cheng, Bao-Ding, 4,604,224, Cl. 252-91.000.
Scott, George V., 4,604,280, Cl. 424-49.000.

Collins, Brian J., to Rolls-Royce Limited. Control systems for gas turbine aeroengines. 4,603,546, Cl. 60-39.020.

Collins, Raymond F.; Ramsden, Christopher A.; Saunders, Libert C.; and Warne, Peter J., to May & Baker Limited. Treating arthritis with 3-(N,N-dimethyl carbamoyl)pyrazolo[1,5-a]pyridine. 4,604,400, Cl. 514-300.000.

Colman, Derek; and Cotton, David R., to Texas Instruments Incorporated. Darlington transistors. 4,604,640, Cl. 357-46.000.

Coloplast A/S: *See—*
Samuelsen, Peter, 4,604,095, Cl. 604-323.000.

Colquhoun, Howard M., to Imperial Chemical Industries PLC. Chemical process. 4,604,485, Cl. 568-319.000.

Colvin, Howard A.; Cottman, Kirkwood S.; and Parker, Dane K., to Goodyear Tire & Rubber Company, The. Functionalized monomers from 1-(1-isocyanato-1-methylethyl)-3- or 4-(1-methylethenyl) benzene. 4,604,439, Cl. 526-288.000.

Combs, Cathy M.: *See—*
Duffy, Joseph K.; Thoene, Mark L.; and Combs, Cathy M., 4,603,780, Cl. 206-591.000.

Combustion Engineering, Inc.: *See—*
Lowrie, Neely E.; and Rooker, Mitchel L., 4,604,196, Cl. 210-136.000.

Commissariat a l'Energie Atomique: *See—*
Abbes, Claude; De Villepoix, Raymond; and Rouaud, Christian, 4,603,892, Cl. 285-336.000.
Chenevas-Paule, Andre ; and Cuchet, Robert, 4,604,527, Cl. 250-578.000.
Perroud, Anne-Marie; and Silvent, Alain, 4,604,228, Cl. 252-492.000.

Concrete Systems, Inc.: *See—*
Ecker, Fred L., 4,604,250, Cl. 264-35.000.

Coney, Michael H.: *See—*
Moss, Roger W.; Coney, Michael H.; and Richardson, David A., 4,604,031, Cl. 416-97.00R.

Conley, Ralph F., Jr.; and Frye, Ricky F., to MIM Industries, Inc. Sewing machine with edge trimmer. 4,603,647, Cl. 112-129.000.

Conoco Inc.: *See—*
McConaghy, James R., Jr.; and Anderson, Ardis L., 4,604,185, Cl. 208-56.000.
Yoon, Heeyoung, 4,604,269, Cl. 423-242.000.

Consolidated Controls Corporation: *See—*
Reinicke, Robert H., 4,604,090, Cl. 604-118.000.

Construction Robotics, Inc.: *See—*
Deike, Robert F., 4,603,520, Cl. 52-98.000.

Conta, Robert L.; and Wallach, Harvey N., to United States Surgical Corporation. Instrument for circular surgical stapling of hollow body organs and disposable cartridge therefor. 4,603,693, Cl. 128-305.000.

Container Development Company: *See—*
Schultheis, Stephen K., 4,603,535, Cl. 53-373.000.

Continental Group, Inc., The: *See*—
Krishnakumar, Suppayan M.; Friendship, Kenneth F. M.; Mahajan, Gautam K.; and Pocock, John F. E., 4,603,831, Cl. 249-144.000.
Continental White Cap, Inc.: *See*—
Lecinski, Frank H., Jr.; and Thomas, William J., 4,603,786, Cl. 215-318.000.
Convergent Technologies, Inc.: *See*—
Burger, John P., 4,604,689, Cl. 364-200.000.
Conway, Richard J.; Watson, Keith G.; and Farquharson, Graeme J., to ICI Australia Limited. Herbicidal 5-(hetero-substituted) cyclohexane-1,3-dione derivatives. 4,604,132, Cl. 71-90.000.
Cook, Kenneth O. Apparatus and method for making color photographic prints. 4,603,965, Cl. 355-38.000.
Copp, James R. Holography. 4,603,937, Cl. 350-368.000.
Cormier, Alan D.: *See*—
Weinberg, Melvin S.; Cormier, Alan D.; and Jones, Ronald L., 4,604,166, Cl. 204-1.00T.
Cornell, Charles R., to J. I. Case Company. Cotton harvester harvesting rotor speed monitor. 4,603,543, Cl. 56-10.200.
Corning Glass Works: *See*—
Bocko, Peter L.; Wein, William J.; and Young, Charles E., 4,604,118, Cl. 65-3.120.
Cornu, Pierre-Jean; Perrin, Claude; Dumaitre, Bernard; and Streichenberger, Gilles. Phenyloxoalkyl piperidines and the pharmaceutical compositions containing them. 4,604,393, Cl. 514-229.000.
Corsello, Vincent: *See*—
Glass, Michael; Corsello, Vincent; Orlandi, Daniel A.; and Guzowski, Anthony, 4,604,288, Cl. 426-5.000.
Cosco, Inc.: *See*—
Maloney, Kevin, 4,603,902, Cl. 297-35.000.
Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Polymerizable thioester synergists. 4,604,417, Cl. 524-199.000.
Cottman, Kirkwood S.: *See*—
Colvin, Howard A.; Cottman, Kirkwood S.; and Parker, Dane K., 4,604,439, Cl. 526-288.000.
Cotton, David R.: *See*—
Colman, Derek; and Cotton, David R., 4,604,640, Cl. 357-46.000.
Cotton, Worth B., Jr., to Industrial Air, Inc. Air washer and method. 4,604,108, Cl. 55-20.000.
Coulthard, Leslie M. F., to GKN Birwelco Limited. Flare for and method of flaring high velocity gas. 4,604,047, Cl. 431-5.000.
Cousens, Donald E.: *See*—
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,603,802, Cl. 228-1.100.
Couvrette, Edward F. Expandable structure for automatic teller machines. 4,603,643, Cl. 109-24.100.
Cowden, James J.: *See*—
Cave, Eric F.; and Cowden, James J., 4,603,512, Cl. 51-229.000.
Cowles, John C., to Mars Incorporated. Vending machine power switching apparatus. 4,604,557, Cl. 318-98.000.
Cox, Roger A., to Telex Communications, Inc. Parasitic array with driven sleeve element. 4,604,628, Cl. 343-818.000.
Coyle, Catherine L.: *See*—
Edelson, Edward H.; Stiefel, Edward I.; Chianelli, Russell R.; and Coyle, Catherine L., 4,604,183, Cl. 208-420.000.
Crabtree, Robert P.; and Kelly, Keith F., Jr., to International Business Machines Corp. Dynamic configuration for added devices. 4,604,690, Cl. 364-200.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. [(2,3,9,9a-tetrahydro-3-oxo-9a-substituted-1H-fluoren-7-yl)oxy]ethanimidamides and [(2,3,9,9a-tetrahydro-3-oxo-9a-substituted-1H-fluoren-7-yl)oxy]ethanimidic acid hydrazides, their derivatives and their salts. 4,604,396, Cl. 514-256.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Use of substituted-3(2,3-dihydro-1H-inden-5-yl)-4-hydroxy-1H-pyrrole-2,5-diones for treating grey matter edema. 4,604,403, Cl. 514-425.000.
Craig Medical Products, Limited: *See*—
Steer, Peter L., 4,603,837, Cl. 251-352.000.
Craver, Richard D., to Orrville Products, Inc. Fireplace insert. 4,603,683, Cl. 126-138.000.
Creighton, Thomas C.; Dorsey, William C.; Lewicki, Walter J., Jr.; Long, Harry F.; and Ringer, Richard M., to Armstrong World Industries, Inc. Stress-free, embossed, ornamented tile surface covering and process for making the same. 4,604,312, Cl. 428-137.000.
Crimmins, Arthur G., Jr., to Crimmins, Joan M. Means for securing and aligning the barrels of two pistols substantially parallel. 4,603,497, Cl. 42-106.000.
Crimmins, Joan M.: *See*—
Crimmins, Arthur G., Jr., 4,603,497, Cl. 42-106.000.
Cronenwett, Duane; and Gottfried, Robert W. Roofing system. 4,603,529, Cl. 52-536.000.
Crophandling Systems Limited: *See*—
Byers, Stuart D.; and Clark, John F., 4,603,525, Cl. 52-245.000.
Cross, Lindsay E.: *See*—
Watson, Keith G.; Wishart, John D.; Farquharson, Graeme J.; Bird, Graham J.; and Cross, Lindsay E., 4,604,128, Cl. 71-88.000.
Cross, Thomas E., Jr.; and Hults, Gerald J., to Medtronic, Inc. Lead connector. 4,603,696, Cl. 128-419.00P.
Crow, Robert P. Visibility enhancement system. 4,603,973, Cl. 356-5.000.
Crown International, Inc.: *See*—
Stanley, Gerald R., 4,604,719, Cl. 364-721.000.
Cruijsen, Hermanus G. M., to Volvo Car B.V. Means for maintaining clutch disengagement where transmission is neutral. 4,603,765, Cl. 192-85.00V.
Cruttwell, Ian A.: *See*—
Knowles, William R.; and Cruttwell, Ian A., 4,604,523, Cl. 250-310.000.
Csabanko, Istvan: *See*—
Benko, Eva; Csabanko, Istvan; Porkolab, Aniko ; Szabo, Zsolt; and Takacs, Gabor, 4,604,086, Cl. 494-16.000.
Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Gandini, Marco; and Sartori, Mario, 4,604,740, Cl. 370-27.000.
Cuchet, Robert: *See*—
Chenevas-Paule, Andre ; and Cuchet, Robert, 4,604,527, Cl. 250-578.000.
Cuevas-Cumming, Pablo, to Chrysler Corporation. Personal computer storage cabinet. 4,603,925, Cl. 312-196.000.
Cukier, Samuel; and Kremer, Henry A. F. L., to Domtar Inc. Modified coal-tar pitch. 4,604,184, Cl. 208-22.000.
Culbertson, Townley P.: *See*—
Mich, Thomas F.; Culbertson, Townley P.; and Domagala, John M., 4,604,401, Cl. 514-312.000.
Curnutt, Jerald L.: *See*—
Harley, A. Dale; Curnutt, Jerald L.; and Doughty, David T., 4,604,242, Cl. 558-260.000.
Cusack, Robert F., to Valeron Corporation. Probe shield. 4,603,482, Cl. 33-169.00R.
Cuzic, John E.: *See*—
Stoesser, Paul R.; Cuzic, John E.; and McLaren, John W., 4,603,812, Cl. 239-329.000.
Cygnarowicz, Leonard P.: *See*—
Smith, Ronald A.; Jackson, James M.; Lehfeldt, Carl L.; Cygnarowicz, Leonard P.; Moshfegh, Khosro; Blanchard, Kenneth L.; and Nelson, Kenneth J., 4,603,567, Cl. 72-8.000.
Czupryna, Gary; Natansohn, Samuel; Long, Robert A.; and Munn, Robin W., to GTE Products Corporation; and GTE Laboratories Incorporated. Process for the growth of alpha silicon nitride whiskers. 4,604,273, Cl. 423-344.000.
DaFoe, Ralph H.: *See*—
Amezcua, Robert; Clements, Silous F.; Coenen, John S.; DaFoe, Ralph H.; Day, Michael N.; Ross, Dennis M.; and Simpson, Richard O., 4,604,710, Cl. 364-900.000.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,604,411, Cl. 522-14.000.
Dai, Shenghong A.; Grossman, Steven J.; and Onder, Kemal, to Dow Chemical Company, The. Polymer from azetidine-2,4-dione and polyol or polyamine. 4,604,450, Cl. 528-322.000.
Daigo Nutritive Chemicals, Ltd.: *See*—
Kawajiri, Seizo, 4,604,286, Cl. 424-149.000.
Daikin Kogyo Co., Ltd.: *See*—
Ohmori, Akira; Takaki, Shoji; and Kitahara, Takahiro, 4,604,482, Cl. 560-213.000.
Dailey, Nils; Rai, Vishva; Southall, Kenneth; and Webster, Timothy J., to AMF Inc. Multicartridge chromatography cartridge housing. 4,604,198, Cl. 210-198.200.
Daimler-Benz Aktiengesellschaft: *See*—
Heintz, Harald M., 4,603,915, Cl. 301-37.00P.
Dalal, Vikram L., to Chronar Corp. Microcrystalline semiconductor method and devices. 4,604,636, Cl. 357-2.000.
Damiron, Pierre M.; Legoupil, Jean-Luc; and Brosson, Jacques, to Clecim. Acid pickling tank for metal strips. 4,604,157, Cl. 156-345.000.
Dance, William E.: *See*—
Carollo, Sammy F.; and Dance, William E., 4,604,649, Cl. 358-111.000.
Dang, Hiep D.: *See*—
Morris, Gregory J. E.; Pimlott, John R.; Beaver, Richard N.; Dang, Hiep D.; and Grosshandler, Sandor, 4,604,171, Cl. 204-98.000.
DaPrato, Philip L.: *See*—
Aquino, Dolores C.; DaPrato, Philip L.; Gouker, Toby R.; and Knoer, Peter, 4,604,105, Cl. 48-197.00R.
Dart Industries Inc.: *See*—
Barrett, Keith, 4,604,026, Cl. 414-728.000.
Data General Corp.: *See*—
Epstein, David I., 4,604,684, Cl. 364-200.000.
Dauer, Alois: *See*—
Cohen, Howard; and Dauer, Alois, 4,603,481, Cl. 33-138.000.
Daugherty, Donald L., to Bunn-O-Matic Corporation. VPS with hot water dispenser. 4,603,620, Cl. 99-300.000.
Davatz, Christian R. Hand control for foot control trolling motor. 4,604,066, Cl. 440-7.000.
Davidenko, Nikolai I.: *See*—
Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., 4,604,724, Cl. 364-478.000.
Davidson, Eldon F. Phase-locked digital very high frequency omnirange (VOR) receiver. 4,604,625, Cl. 343-401.000.
Davidson, Mel, to CMR Enterprises, Inc. Tankless electric water heater with staged heating element energization. 4,604,515, Cl. 219-298.000.
Davidson, Robert I., to Ethyl Corporation. Arylation of olefins. 4,604,243, Cl. 558-388.000.
Davies, George G.; McGlade, Stuart M.; and Dunn, Peter L., to Marconi Company Limited, The. Rotary apparatus having code track with pseudo-random binary digit sequence for indicating rotational position. 4,604,725, Cl. 364-900.000.

Davies, Theodore E.; Quinn, Dennis E.; and Watson, James E., to Gas Research Institute. Regenerative burner. 4,604,051, Cl. 431-166.000.

Davis, C. Paul; and Neuman, Eli, to PerfectData Corporation. Apparatus and method for enhancing flexible magnet disk performance. 4,604,672, Cl. 360-137.000.

Davis, Esker K.; and Chew, William F., to GTI Corporation. Multiple module furnace system. 4,603,730, Cl. 165-30.000.

Davis, J. Stanley; and Radford, Steven R., to Norton Christensen, Inc. Apparatus for downward displacement of an inner tube within a coring barrel. 4,603,749, Cl. 175-250.000.

Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 1-[3-(6-fluoro-1,2-benzisoxazol-3-yl)propyl]-4-(substituted)-piperazines. 4,604,395, Cl. 514-255.000.

Dawson, Jeffrey C., to BJ-Titan Services Company. Aqueous acid gels and use thereof. 4,604,218, Cl. 252-8.55C.

Day, Michael N.: *See—*
Amezcua, Robert; Clements, Silous F.; Coenen, John S.; DaFoe, Ralph H.; Day, Michael N.; Ross, Dennis M.; and Simpson, Richard O., 4,604,710, Cl. 364-900.000.

de la Poype, Roland, to Societe D'Etude et D'Application Industrielle de Brevets; and Baxter Travenol Laboratories, Inc. Apparatus for forming a web of film into a tubular shape in a form, fill and seal packaging machine. 4,603,536, Cl. 53-410.000.

de la Rosa, Rudolpho. Food warming cartridge. 4,604,053, Cl. 431-320.000.

Dean, Raymond S.; and Barabino, William A., to Physiological Research Associates. Disposable diaper with integral disposal system. 4,604,096, Cl. 604-385.00A.

Dean, William B.: *See—*
McCall, Clyde A.; Campbell, Michael J.; and Dean, William B., 4,604,315, Cl. 428-230.000.

Debono, Manuel, to Eli Lilly and Company. C-23-substituted mycaminosyltylonolide compounds, pharmaceutical compositions and methods of use. 4,604,380, Cl. 514-30.000.

Deckman, Harry W.; and Dunsmuir, John H., to Exxon Research and Engineering Co. Improvements in contrast of a positive polymer resist having a glass transition temperature through control of the molecular weight distribution and prebaked temperature. 4,604,305, Cl. 427-385.500.

Deckner, George E.; Mercado, Clara G.; and Krog, Ann M., to Charles of the Ritz Group Ltd. Cosmetic and skin treatment compositions containing acetylated sterols. 4,604,281, Cl. 424-59.000.

Dee Zee Manufacturing: *See—*
Elweli, Dennis L.; and Sills, Robert L., 4,604,013, Cl. 410-106.000.

Deep Ocean Engineering Incorporated: *See—*
Hawkes, Graham S.; and Glz, Walter I., 4,604,559, Cl. 318-563.000.

Deering, Roland F., to Union Oil Company of California. System for removing solids from a solids upflow vessel. 4,604,019, Cl. 414-187.000.

DeFord, Henry S.; and Moss, Owen R., to Battelle Development Corporation. Pressure multiplying dispenser. 4,603,794, Cl. 222-207.000.

Degnan, Thomas F.: *See—*
Chen, Nai Y.; and Degnan, Thomas F., 4,604,261, Cl. 422-191.000.

Degremont: *See—*
Louboutin, Robert; and Gibaud, Jean, 4,604,197, Cl. 210-150.000.

Dehm, Henry C., to Hercules Incorporated. Chemical case bond system with azido compound bonding. 4,604,248, Cl. 264-3.100.

Dehn, Freddie H. Universal dedicated fixture for frame straightening rack. 4,603,570, Cl. 72-305.000.

Deighton, Michael O.: *See—*
Watkins, Roger D.; Gillespie, Arthur B.; Deighton, Michael O.; Pike, Roger B.; and Scott-Kestin, Colin B., 4,604,612, Cl. 340-582.000.

Deike, Robert F., to Construction Robotics, Inc. Post mounting anchor base. 4,603,520, Cl. 52-98.000.

Dekura, Hitoshi, to Kabushiki Kaisha Toshiba. Image forming apparatus with a display device for matching the image size with the copying sheet size. 4,603,962, Cl. 355-3.00R.

DelCoco, Robert J.; Borsuk, Gerald M.; and Lampe, Donald R., to Westinghouse Electric Corp. Three line video scrambling method. 4,604,650, Cl. 358-119.000.

Dellicicchi, Alfred J.: *See—*
Manton, John C.; Bruckert, William F.; and Dellicicchi, Alfred J., 4,604,750, Cl. 371-38.000.

Delon, Patrice C. G.; Fourreaux, Gerard D.; Nicolas, Michel J. R.; and Sebilet, Bruno R., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A. Proximity radar. 4,604,622, Cl. 343-5.0PD.

DelSonno, Lawrence R.: *See—*
Blount, Frederick T.; Capowski, Robert S.; Casper, Daniel F.; DelSonno, Lawrence R.; Geller, Robert F.; Kusmiss, Joseph M.; and Zimmerman, Terrence K., 4,604,709, Cl. 364-900.000.

De Luca, Michael A.; and McCormack, John F., to Kollmorgen Technologies Corporation. Metallization of ceramics. 4,604,299, Cl. 427-98.000.

Demarest, Henry M., Jr.; Matesa, Joseph M.; and Kunkle, Gerald E., to PPG Industries, Inc. Method of pretreating glass batch. 4,604,121, Cl. 65-27.000.

De Matteis, Maria C. Screening test for beta-thalassemia trait and a diagnostic kit for its individualization. 4,604,350, Cl. 435-29.000.

Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corporation. Process for the resolution of pyrano[3,4-b]indole-1-acetic acids. 4,604,469, Cl. 548-432.000.

Demeure, Alain, to Thomson CSF. Digital device for the formation of sonar channels. 4,604,736, Cl. 367-123.000.

deMey, Charles F., II, to Perkin-Elmer Corporation, The. Shutter mechanism. 4,603,835, Cl. 251-215.000.

de Montigny, Armand: *See—*
Oberkirch, Wolfgang; de Montigny, Armand; and Botsch, Hansjurgen, 4,603,738, Cl. 166-275.000.

Dempsey, Daniel J.; and Parker, Kent L., to Carrier Corporation. Furnace inducer outlet box assembly. 4,603,680, Cl. 126-99.00A.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Nabeta, Takeshi; and Hanahara, Isamu, 4,604,413, Cl. 523-137.000.

de Nora, Oronzio: *See—*
Nidola, Antonio; and de Nora, Oronzio, 4,604,173, Cl. 204-105.00R.

Dentsply Research & Development Corp.: *See—*
Kacicz, Joseph M.; and Fonvielle, Frank P., 4,604,366, Cl. 501-6.000.

Derbyshire, Francis J.; and Varghese, Philip, to Mobil Oil Corporation. Hydrocracking of heavy feeds with dispersed dual function catalyst. 4,604,189, Cl. 208-111.000.

Derevyanko, Yan N.: *See—*
Naumov, Jury I.; Juzefovich, Dmitry K.; Epifanova, Valentina S.; Kucherenko, Vladimir I.; Flerov, Valery N.; Praporov, Anatoly M.; Shustov, Vladimir P.; Sychev, Alexel E.; Korolev, Georgy V.; Kotov, Evgeny P.; and Derevyanko, Yan N., 4,604,175, Cl. 204-151.000.

DeShon, Wallace E., to Phillips Petroleum Company. Automatic switching apparatus and method. 4,604,661, Cl. 360-69.000.

de Smet, Gabriel, to Union Siderurgigue du Nord et de l'Est de la France. Multi-layer composite-wall panel or case structure. 4,604,327, Cl. 428-594.000.

Desprez, Marc; and Laurenceau, Serge, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process and installation for heating a channel containing glass by means of oxyfuel flames. 4,604,123, Cl. 65-134.000.

Desrosiers, Luc: *See—*
Lalancette, Jean M.; Chevalier-Bultel, Jean P.; and Desrosiers, Luc, 4,604,140, Cl. 106-38.900.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Adis, Erich; Bader, Manfred; and Buschulte, Winfried, 4,604,104, Cl. 48-107.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Dudek, Gunther, 4,603,608, Cl. 81-463.000.

Deutsche Thomson-Brandt GmbH: *See—*
Maier, Gerhard; and Lange, Joachim, 4,604,571, Cl. 324-77.00A.

Deutschle, Robert, to E. C. H. Will (GmbH & Co.). Apparatus for transporting paper stacks. 4,603,768, Cl. 198-369.000.

De Villepoix, Raymond: *See—*
Abbes, Claude; De Villepoix, Raymond; and Rouaud, Christian, 4,603,892, Cl. 285-336.000.

Dias, Francisco J.: *See—*
Luhleich, Hartmut; and Dias, Francisco J., 4,604,249, Cl. 264-29.500.

Diebold, Rick: *See—*
Miles, Kevin; M., 4,603,846, Cl. 271-2.000.

Diesel Kiki Co., Ltd.: *See—*
Ueno, Masahito, 4,603,668, Cl. 123-352.000.

Digital Equipment Corporation: *See—*
Manton, John C.; Bruckert, William F.; and Dellicicchi, Alfred J., 4,604,750, Cl. 371-38.000.

Digonnet, Michel J. F.: *See—*
Shaw, Herbert J.; Digonnet, Michel J. F.; Bergh, Ralph A.; Sorin, Wayne V.; and Kolner, Brian H., 4,603,940, Cl. 350-96.150.

Dipzinski, Eugene S.: *See—*
Brown, Trevor J.; and Dipzinski, Eugene S., 4,603,914, Cl. 301-37.00P.

Disco Abrasive Systems, Ltd.: *See—*
Takatoshi, Ono, 4,603,609, Cl. 82-51.000.

Dittrich, Patrick E., to Auscilla Plastics, Inc. Molded bearing. 4,603,982, Cl. 384-129.000.

Diversey Wyandotte Corporation: *See—*
Stanton, James H., 4,604,220, Cl. 252-33.400.

Dixon Valve & Coupling Company: *See—*
Goodall, Richard L.; and Singh, Paramjit, 4,603,888, Cl. 285-55.000.

DM International Inc.: *See—*
Lutz, Irvin H.; and Wilson, Thomas M., 4,604,186, Cl. 208-50.000.

Doboy Packaging Machinery, Inc.: *See—*
Eaves, Fred W.; and Sommer, Wayne D., 4,604,704, Cl. 364-478.000.

Dr. Karl Thomae GmbH: *See—*
Reiffen, Manfred; Noll, Klaus; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,604,389, Cl. 514-213.000.

Dr. Muller AG: *See—*
Muller, Hans, 4,604,201, Cl. 210-323.200.

Dr. Techn. Ernst Linsinger & Co. GmbH: *See—*
Rungger, Helmut; Fuchs, Erwin; and Knoll, Johann, 4,604,011, Cl. 409-138.000.

Dodgen Industries, Inc.: *See—*
Dodgen, John N., 4,603,900, Cl. 296-156.000.

Dodgen, John N., to Dodgen Industries, Inc. Upper bed structure for a recreational vehicle. 4,603,900, Cl. 296-156.000.

Doi, Shin: *See—*
Yamada, Yukiyoshi; Doi, Shin; and Yasuguchi, Masayuki, 4,604,192, Cl. 209-144.000.

Doi, Tadashi: *See*—
Oi, Naobumi; Doi, Tadashi; and Nagase, Masayuki, 4,604,207, Cl. 210-635.000.
Domagala, John M.: *See*—
Mich, Thomas F.; Culbertson, Townley P.; and Domagala, John M., 4,604,401, Cl. 514-312.000.
Dombroski, Amy: *See*—
Glass, Michael; Hoholick, Joseph; Oppenheimer, Alfred; and Dombroski, Amy, 4,604,287, Cl. 426-5.000.
Domtar Inc.: *See*—
Cukier, Samuel; and Kremer, Henry A. F. L., 4,604,184, Cl. 208-22.000.
Donahue, Raymond J.: *See*—
Hesterberg, William G.; Donahue, Raymond J.; and Sheaffer, Benjamin L., 4,603,665, Cl. 123-195.00R.
Donely, Dean: *See*—
Baker, Robert W.; Donely, Dean; and Odorcic, Vlado, 4,604,610, Cl. 340-566.000.
Donnadieu, Andre ; and Letoffe , Michel, to Rhone-Poulenc Specialites Chimiques. Curable organopolysiloxane compositions comprising microencapsulated hardening accelerators. 4,604,444, Cl. 528-34.000.
Doppling, Horst; Hertrich, Steffen; Poschl, Walter; Ritter, Joachim; and Sill, Karl, to INA Walzlager Schaeffler KG. Inner race for a swashplate mechanism. 4,603,923, Cl. 384-7.000.
Dorflinger, Benno; and Steinebrunner, Walter, to Anton Zahoransky. Apparatus for storing and manipulating bundles of bristles in brush making machines. 4,603,913, Cl. 300-7.000.
Dorfman, Leslie J.: *See*—
McGill, Kevin C.; and Dorfman, Leslie J., 4,603,703, Cl. 128-731.000.
Dorr-Oliver Incorporated: *See*—
Bollinger, James M.; and Klinkowski, Peter R., 4,604,174, Cl. 204-151.000.
Dorsey, William C.: *See*—
Creighton, Thomas C.; Dorsey, William C.; Lewicki, Walter J., Jr.; Long, Harry F.; and Ringer, Richard M., 4,604,312, Cl. 428-137.000.
Doughty, David T.: *See*—
Harley, A. Dale; Curnutt, Jerald L.; and Doughty, David T., 4,604,242, Cl. 558-260.000.
Douglas, Alan D.; Reilly, Kenneth T.; Landmesser, John E.; Landry, Richard E.; and MacInnis, Martin B., to GTE Products Corporation. Recovery of tungsten and rhenium. 4,604,265, Cl. 423-49.000.
Douglas, Alan D.: *See*—
Reilly, Kenneth T.; Munn, Robin W.; Hoffman, Henry E.; and Douglas, Alan D., 4,604,278, Cl. 423-517.000.
Dow Chemical Company, The: *See*—
Berman, Jody R.; Berkefelt, Christine C.; and Aldrich, Dale J., 4,604,317, Cl. 428-285.000.
Dai, Shenghong A.; Grossman, Steven J.; and Onder, Kemal, 4,604,450, Cl. 528-322.000.
Fiegener, Dale R.; and Broussard, Felix J., 4,604,178, Cl. 204-286.000.
Harley, A. Dale; Curnutt, Jerald L.; and Doughty, David T., 4,604,242, Cl. 558-260.000.
Lin, Chung-Yuan, 4,604,210, Cl. 210-690.000.
Lund, Gary K., 4,604,374, Cl. 502-115.000.
Morris, Gregory J. E.; Pimlott, John R.; Beaver, Richard N.; Dang, Hiep D.; and Grosshandler, Sandor, 4,604,171, Cl. 204-98.000.
Rubens, Louis C., 4,604,426, Cl. 525-123.000.
Stoesser, Paul R.; Cuzic, John E.; and McLaren, John W., 4,603,812, Cl. 239-329.000.
Dow Corning Corporation: *See*—
Cole, Richard L.; and Janik, Gloria, 4,604,424, Cl. 524-862.000.
Juen, Donnie R., 4,604,478, Cl. 556-439.000.
Dozer, Charles S., to Charles S. Dozer Enterprises, Inc. Train system with variably tilting rail. 4,603,638, Cl. 104-95.000.
Dresser Industries, Inc.: *See*—
Hammoud, Ezzat A., 4,604,025, Cl. 414-698.000.
Dressler, Hans; and Meilus, Albert A., to Koppers Company, Inc. Synthetic oils. 4,604,491, Cl. 585-26.000.
Dubertret, Louis: *See*—
Bell, Eugene; and Dubertret, Louis, 4,604,346, Cl. 435-1.000.
Dubler, Alfred: *See*—
Miles, Kevin; M., 4,603,846, Cl. 271-2.000.
Dubler, David: *See*—
Miles, Kevin; M., 4,603,846, Cl. 271-2.000.
Ducate, John S., Sr. Apparatus for assembling blower wheel blades. 4,603,773, Cl. 198-468.200.
Dudek, Gunther, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Remotely-manipulated apparatus for performing maintenance work in shielded cells. 4,603,608, Cl. 81-463.000.
Dufford, Edward L.: *See*—
Chang, Wen-Hsuan; and Dufford, Edward L., 4,604,443, Cl. 528-28.000.
Duffy, Joseph K.; Thoene, Mark L.; and Combs, Cathy M., to Baxter Travenol Laboratories, Inc. Carton for housing fragile containers. 4,603,780, Cl. 206-591.000.
Dufour, Mark D.: *See*—
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,603,802, Cl. 228-1.100.
Dumaitre, Bernard: *See*—
Cornu, Pierre-Jean; Perrin, Claude; Dumaitre, Bernard; and Streichenberger, Gilles, 4,604,393, Cl. 514-229.000.
Dunn, Peter L.: *See*—
Davies, George G.; McGlade, Stuart M.; and Dunn, Peter L., 4,604,725, Cl. 364-900.000.
Dunsmuir, John H.: *See*—
Deckman, Harry W.; and Dunsmuir, John H., 4,604,305, Cl. 427-385.500.
Du Pont de Nemours, E. I., and Company: *See*—
Bartlett, Philip L., 4,604,226, Cl. 252-389.00A.
Grossa, Mario, 4,604,340, Cl. 430-270.000.
Hanagan, Mary A., 4,604,131, Cl. 71-90.000.
Jagen, Paul R., 4,603,936, Cl. 339-143.00R.
Johnson, Bruce B., 4,604,323, Cl. 428-336.000.
Seago, James L., 4,604,182, Cl. 204-403.000.
Shapiro, Rafael, 4,604,130, Cl. 71-90.000.
Sondergeld, Manfred A. J.; and Grossa, Mario, 4,604,342, Cl. 430-281.000.
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Dupral B.V.: *See*—
Van Breukelen, Jacobus A. T.; and Westerveld, Theodorus, 4,603,572, Cl. 72-385.000.
Dupre , Sylvain: *See*—
Warszawski, Bernard; Fauvel, Pierre; and Dupre , Sylvain, 4,604,332, Cl. 429-38.000.
Durney, Max W. Drilling and counterboring apparatus and method for toe fastening. 4,603,719, Cl. 144-365.000.
Dynamit Nobel AG: *See*—
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,604,476, Cl. 556-401.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Breitscheidel, Hans-Ulrich; and Kautz, Rudolf, 4,603,852, Cl. 272-109.000.
E. C. H. Will (GmbH & Co.): *See*—
Deutschle, Robert, 4,603,768, Cl. 198-369.000.
E et M Lamort S.A.: *See*—
Lamort, Jean-Pierre J., 4,604,193, Cl. 209-273.000.
E. R. Squibb & Sons, Inc.: *See*—
Godfrey, Jollie D., Jr.; Gordon, Eric M.; and Natarajan, Sesha I., 4,604,402, Cl. 514-333.000.
Haslanger, Martin F.; and Karanewsky, Donald S., 4,604,407, Cl. 514-575.000.
Eastman Kodak Company: *See*—
Brownstein, Scott A., 4,603,966, Cl. 355-45.000.
Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,604,449, Cl. 528-288.000.
Sand, I. Daniel; Shepherd, Freddie A.; and Fagerburg, David R., 4,604,446, Cl. 528-173.000.
Eaton-Optimetrix Inc.: *See*—
Phillips, Edward H.; and Wise, Lawrence A., 4,604,562, Cl. 318-640.000.
Eaves, Fred W.; and Sommer, Wayne D., to Doboy Packaging Machinery, Inc. High-speed microprocessor-controlled branch conveyor. 4,604,704, Cl. 364-478.000.
Echte, Adolf: *See*—
Hambrecht, Juergen; Illers, Karl-Heinz; Echte, Adolf; and Swoboda, Johann, 4,604,415, Cl. 524-140.000.
Ecker, Fred L., to Concrete Systems, Inc. Column form support system and method. 4,604,250, Cl. 264-35.000.
Ed Geistlich Sohne AG fur Chemische Industrie: *See*—
Pfirrmann, Rolf W., 4,604,391, Cl. 514-222.000.
Edelson, Edward H.; Stiefel, Edward I.; Chianelli, Russell R.; and Coyle, Catherine L., to Exxon Research and Engineering Co. Catalytic process for hydroconversion of solid carbonaceous materials. 4,604,183, Cl. 208-420.000.
Edgmon, John W., to Hughes Tool Company. Weight actuated tubing valve. 4,603,741, Cl. 166-369.000.
Edwards, David K.; and Kramer, John H., to General Motors Corporation. Washer pick up and placement tool. 4,604,024, Cl. 414-592.000.
Edwards, Jon L.; and Carter, Mark L., to Hydril Company. Subsurface safety valve. 4,603,740, Cl. 166-319.000.
Edwards, Philip N.: *See*—
Yellin, Tobias O.; Edwards, Philip N.; and Large, Michael S., 4,604,465, Cl. 544-326.000.
Egawa, Akira; and Kodaira, Takanori, to Canon Kabushiki Kaisha. Synchronizing device for flash photography. 4,603,954, Cl. 354-137.000.
Eichler, Klaus; and Leupold, Ernst I., to Hoechst Aktiengesellschaft. Process for the isomerization of halogenated thiophenes. 4,604,470, Cl. 549-81.000.
Ekman, Uno; and Hjert, Leif, to Igelfors Bruks AB. Device for transport or displacement of elongated objects in particular, as well as a pulling or traction wheel comprised in said device. 4,603,839, Cl. 254-329.000.
Ekstrand, John A. I. Means for adjusting a sighting instrument in relation to a support. 4,603,826, Cl. 248-205.100.
Elabd, Hammam; Kosonocky, Walter F.; and Battson, Donald F., to RCA Corporation. CCD imagers with pixels at least thirty microns long in the direction of charge transfer. 4,604,652, Cl. 358-213.000.
Electro-Nucleonics, Inc.: *See*—
O'Neill, Sean P.; and Wu, Joseph, 4,604,365, Cl. 436-528.000.
Electrovac, Fabrikation elektronischer Spezialartikel Gesellschaft m.b.H.: *See*—
Lieberth, Karl, 4,603,981, Cl. 374-210.000.
Eli Lilly and Company: *See*—
Abdulla, Riaz F.; and Samaritoni, Jack G., 4,604,127, Cl. 71-66.000.
Debono, Manuel, 4,604,380, Cl. 514-30.000.
Michel, Karl H.; and Kastner, Ralph E., 4,604,239, Cl. 530-317.000.

Spry, Douglas O., 4,604,386, Cl. 514-200.000.

Ellis, Edward J., to Polymer Technology Corporation. Silicone-containing contact lens material and contact lenses made thereof. 4,604,479, Cl. 556-440.000.

Elsasser, Dieter: *See*—
Muller, Rolf; Elsasser, Dieter; von der Heide, Johann; and Papst, Georg, 4,604,665, Cl. 360-97.000.

Elslager, Edward F.; Werbel, Leslie M.; Ortwine, Daniel F.; Worth, Donald F.; Showalter, Howard D. H.; Capps, David B.; Berman, Ellen M.; Gregor, Vlad E.; and Sercel, Anthony D., to Warner-Lambert Company. Antibacterial benzo(chalcogeno)[4,3,2-cd]indazoles. 4,604,390, Cl. 514-222.000.

Eltoukhy, Atef; and Price, Rick C., to Trimedia Corporation. Sputtering-system baffle. 4,604,179, Cl. 204-298.000.

Elwell, Dennis L.; and Sills, Robert L., to Dee Zee Manufacturing. Vehicle side rail assembly. 4,604,013, Cl. 410-106.000.

Emhart Industries, Inc.: *See*—
Keller, Rene , 4,604,122, Cl. 65-29.000.
Stout, Garry A.; and Perry, Leroy A., 4,604,504, Cl. 200-38.00B.
Sweany, Louis P., 4,604,606, Cl. 340-384.00E.

EMI Limited: *See*—
Clutterbuck, Richard C. D.; and Painton, Anthony R., 4,604,536, Cl. 307-603.000.

Endress u. Hauser GmbH u. Co.: *See*—
Woest, Wolfgang; Silbermann, Rainer; and Hegner, Frank, 4,603,455, Cl. 29-25.420.

Engelhart, Jack, to Quality Pool Mfg. Co. Swimming pool coping and clip. 4,603,521, Cl. 52-102.000.

Engle, T. Scott; and Poznick, Jeffrey B., to Mattell, Inc. Push toy. 4,604,074, Cl. 446-171.000.

English, George J.: *See*—
Levin, Robert E.; and English, George J., 4,604,680, Cl. 362-293.000.

Eni-Ente Nazionale Idrocarburi: *See*—
Robertiello, Andrea; and Angelini, Leonello, 4,604,125, Cl. 71-26.000.

Enomoto, Susumu: *See*—
Shindo, Masanori; Aoki, Yusuke; Kataoka, Yosizumi; Enomoto, Susumu; and Nakamura, Minoru, 4,604,418, Cl. 524-296.000.

Enso-Gutzeit Oy: *See*—
Lintunen, Tuomo, 4,604,195, Cl. 210-131.000.

Enterprise Vercelletto: *See*—
Vercelletto, Antoine, 4,603,527, Cl. 52-410.000.

Entingh, Melvin E. Water conditioner valve and system. 4,604,194, Cl. 210-98.000.

Envirex Inc.: *See*—
Sullivan, Richard A., 4,604,206, Cl. 210-603.000.

Enzymes of America: *See*—
Callewaert, Denis M.; and Braxton, Earl J., 4,604,357, Cl. 435-215.000.

Epifanova, Valentina S.: *See*—
Naumov, Jury I.; Juzefovich, Dmitry K.; Epifanova, Valentina S.; Kucherenko, Vladimir I.; Flerov, Valery N.; Praporov, Anatoly M.; Shustov, Vladimir P.; Sychev, Alexel E.; Korolev, Georgy V.; Kotov, Evgeny P.; and Derevyanko, Yan N., 4,604,175, Cl. 204-151.000.

Epstein, David I., to Data General Corp. Digital computer having unique instruction decoding logic. 4,604,684, Cl. 364-200.000.

Erdmann, Jurgen: *See*—
Fetzer, Gunter; and Erdmann, Jurgen, 4,603,976, Cl. 356-402.000.

Erhardt, Paul W.: *See*—
Kam, Sheung-tsam; Erhardt, Paul W.; Borgman, Robert J.; and O'Donnell, John P., 4,604,481, Cl. 560-39.000.

Erickson, Donald C. High pressure oxygen pumped LOX rectifier. 4,604,116, Cl. 62-13.000.

Erickson, Robert A., to Kennametal Inc. Mechanically fastened center vacuum roof drill bit. 4,603,751, Cl. 175-410.000.

Ernst Leitz Wetzlar GmbH: *See*—
Atalar, Abdullah, 4,603,585, Cl. 73-606.000.

ERO, Inc.: *See*—
Henninger, William H., 4,604,505, Cl. 200-50.00B.

Erwin Sick GmbH Optik-Elektronik: *See*—
Fetzer, Gunter; and Erdmann, Jurgen, 4,603,976, Cl. 356-402.000.

ESPE Fabrik pharmazeutischer Praparate GmbH: *See*—
Pfannenstiel, Hubert; and Hubner, Heinz-Joachim, 4,603,726, Cl. 164-35.000.

Espinoza, John A.; Konchan, Jeffrey L.; and Rimbey, Ronald P., to General Motors Corporation. Control means for occupant restraint belt system. 4,603,877, Cl. 280-807.000.

Essary, Larry, to Essary, Larry. Multi-use job box. 4,603,787, Cl. 220-1.500.

Esselte Sanden AB: *See*—
Thell, Bengt, 4,604,630, Cl. 346-1.100.

Essex Group, Inc.: *See*—
Keys, Steven F.; and Peppler, Dennis L., 4,604,300, Cl. 427-120.000.

Eston, Gary A. Insole with moldable material. 4,603,493, Cl. 36-44.000.

Ethyl Corporation: *See*—
Davidson, Robert I., 4,604,243, Cl. 558-388.000.
Ihrman, Kryn G., 4,604,484, Cl. 564-305.000.
Raley, Garland E.; and Spear, Dean M., 4,604,156, Cl. 156-294.000.
Ramachandran, Venkataraman; and Ranken, Paul F., 4,604,467, Cl. 546-346.000.
Zaweski, Edward F.; and Niebylski, Leonard M., 4,604,102, Cl. 44-57.000.

Eugen Beck, KG: *See*—
Beck, Rainer; and Schulte, Alfons, 4,603,951, Cl. 351-156.000.

Eumuco Aktiengesellschaft fur Maschinenbau: *See*—
Werner, Eberhard, 4,604,021, Cl. 414-226.000.

Eurosab S.R.L.: *See*—
Bretti, Carlo; Sermidi, Franco; and Agnelli, Medardo, 4,603,465, Cl. 29-564.600.

Evans, Robert D.; and Halverson, Ward D., to Spire Corporation. X-ray mask blank process. 4,604,292, Cl. 427-39.000.

Evans, Robert E.; and Hirschbuehler, Kevin R., to American Cyanamid Company. Thermoplastic interleafed resin matrix composites with improved impact strength and toughness. 4,604,319, Cl. 428-290.000.

Evans, William R., to AMP Incorporated. Board to board edge connector. 4,603,928, Cl. 339-17.0LM.

Everlast World's Boxing Headquarters Corp.: *See*—
Golomb, John C., 4,603,439, Cl. 2-18.000.

Evolutionary Concepts, Inc.: *See*—
Sjoquist, Dennis R., 4,603,832, Cl. 251-30.020.

Excelco International, Inc.: *See*—
Klaus, Irving; Herbstman, Warren; and Lopez, Jairo, 4,604,059, Cl. 433-217.100.

Excello Specialty Company, The: *See*—
Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., 4,604,302, Cl. 427-208.600.

Exxon Research and Engineering Co.: *See*—
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,604,190, Cl. 208-112.000.
Deckman, Harry W.; and Dunsmuir, John H., 4,604,305, Cl. 427-385.500.
Edelson, Edward H.; Stiefel, Edward I.; Chianelli, Russell R.; and Coyle, Catherine L., 4,604,183, Cl. 208-420.000.
Soled, Stuart L.; and Fiato, Rocco A., 4,604,375, Cl. 502-241.000.

Eyermann, Manfred; Kettenacker, Gunter; and Zimmermann, Kurt. Drift resistant magnet strength signal evaluation circuit. 4,604,573, Cl. 324-205.000.

Fadner, Thomas A., to Rockwell International Corporation. Copper and nickel layered ink metering roller. 4,603,634, Cl. 101-426.000.

FAG Kugelfischer Georg Schafer (KgaA): *See*—
Hofmann, Heinrich; and Markfelder, Gunter, 4,603,983, Cl. 384-512.000.

Fagerburg, David R.: *See*—
Sand, I. Daniel; Shepherd, Freddie A.; and Fagerburg, David R., 4,604,446, Cl. 528-173.000.

Fairchild Camera & Instrument Corporation: *See*—
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,603,802, Cl. 228-1.100.

Fairchild Semiconductor Corporation: *See*—
Strain, Robert J., 4,603,471, Cl. 29-576.00B.

Fang, Lawrence: *See*—
Labovitz, Jeffrey N.; and Fang, Lawrence, 4,604,134, Cl. 71-92.000.

Fanuc Limited: *See*—
Takekoshi, Yoshitaka; and Ushiyama, Shigeyuki, 4,604,521, Cl. 250-231.0SE.

Faraone, Lorenzo; and Patterson, David L., to RCA Corporation. Process of producing thick layers of silicon dioxide. 4,604,304, Cl. 427-255.000.

Farkas, Robert; and Hohmann, Lothar M., to Polymer Tectonics, Limited. Moulding compositions from melamine-formaldehyde resoles. 4,604,448, Cl. 528-232.000.

Farley, Owen E., Jr.; and Hopkins, Gerard T. Kinder bar and kinder grow. 4,603,828, Cl. 248-542.000.

Farmitalia Carlo Erba S.p.A.: *See*—
Penco, Sergio; Arcamone, Federico; and Casazza, Anna Maria, 4,604,381, Cl. 514-34.000.

Farquharson, Graeme J.: *See*—
Conway, Richard J.; Watson, Keith G.; and Farquharson, Graeme J., 4,604,132, Cl. 71-90.000.
Watson, Keith G.; Wishart, John D.; Farquharson, Graeme J.; Bird, Graham J.; and Cross, Lindsay E., 4,604,128, Cl. 71-88.000.

Farr, Robert W. E.; and Judd, Ian D., to International Business Machines Corp. Video display system employing pulse stretching to compensate for image distortion. 4,604,614, Cl. 340-728.000.

Fartmann, Norbert: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Franz-Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,603,998, Cl. 403-322.000.

Faulkner, Richard D.: *See*—
McDonie, Arthur F.; and Faulkner, Richard D., 4,604,545, Cl. 313-105.0CM.

Fauvel, Pierre: *See*—
Warszawski, Bernard; Fauvel, Pierre; and Dupre , Sylvain, 4,604,332, Cl. 429-38.000.

Fecker, Rainer: *See*—
Markgraf, Wilhelm; Lehmann, Werner; and Fecker, Rainer, 4,603,848, Cl. 271-125.000.

FECO Engineered Systems, Inc.: *See*—
Hengle, Robert E.; and Granfors, William F., 4,603,491, Cl. 34-191.000.

Feigt, Ingmar; Feldtkeller, Ernst; and Lange, Gottfried, to Siemens Aktiengesellschaft. Apparatus for recording and reproducing an electrographic image. 4,604,634, Cl. 346-160.000.

Felder, Christian, to Gebhardt Fordertechnik GmbH. Sorting installation for piece goods. 4,603,771, Cl. 198-367.000.

Feldtkeller, Ernst: *See*—
Feigt, Ingmar; Feldtkeller, Ernst; and Lange, Gottfried, 4,604,634, Cl. 346-160.000.
Fenner, Gordon H.; and Brown, Ronald L., to Marathon Corporation. Apparatus for monitoring the fullness of a compactor. 4,603,625, Cl. 100-53.000.
Fennes, Walter. Collapsible mobile building. 4,603,518, Cl. 52-66.000.
Fenwick, Jay G., to R. J. Reynolds Tobacco Company. Adjustable shelf assembly. 4,603,782, Cl. 211-153.000.
Fergason, James L., to Manchester R & D Partnership. Liquid crystal graphics imager and method. 4,603,945, Cl. 350-331.00R.
Ferguson, Dennis R. Feed system for punch press. 4,603,611, Cl. 83-50.000.
Fernandes, Pete M.; and Taforo, Terrance A., to Cetus Corporation. Pharmaceutical compositions of microbially produced interleukin-2. 4,604,377, Cl. 514-8.000.
Ferno Washington, Inc.: *See*—
Bourgraf, Elroy E., 4,604,022, Cl. 414-340.000.
Ferrofluidics Corporation: *See*—
Borduz, Lucian; and Raj, Kuldip, 4,604,222, Cl. 252-62.520.
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Fetzer, Gunter; and Erdmann, Jurgen, to Erwin Sick GmbH Optik-Elektronik. Optical mark recognition apparatus. 4,603,976, Cl. 356-402.000.
Fiato, Rocco A.: *See*—
Soled, Stuart L.; and Fiato, Rocco A., 4,604,375, Cl. 502-241.000.
Fiegener, Dale R.; and Broussard, Felix J., to Dow Chemical Company, The. Anode. 4,604,178, Cl. 204-286.000.
Figgie International Inc.: *See*—
Chambers, Gary C.; and Hychalk, Leonard V., 4,603,752, Cl. 180-6.400.
Findeva AG: *See*—
Fink, Willy, 4,604,029, Cl. 415-92.000.
Fink, Willy, to Findeva AG. Compressed-air vibrator with turbine drive. 4,604,029, Cl. 415-92.000.
Fiore, Joseph V.: *See*—
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Fiore, Russell D. Exercising device. 4,603,856, Cl. 272-131.000.
Firestone Tire & Rubber Co., The: *See*—
Kay, Edward L.; and Roskos, Kenneth B., 4,604,445, Cl. 528-64.000.
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Schott, Eberhard P.; Fischer, Volker; Jung, Johann; and Rosebrock, Henning, 4,604,129, Cl. 71-76.000.
Fish, Donald D., to W. F. Meyers Company, Inc. Belt-configured saw for cutting slots into stone. 4,603,678, Cl. 125-21.000.
Fish, Richard H., to United States of America, Energy. Removal of arsenic, vanadium, and/or nickel compounds from petroliferous liquids. 4,604,191, Cl. 208-251.00R.
Fisher, Carl, Jr.; Carrington, Charles R.; and Grant, George A., to Integrated Sciences, Inc. Apparatus for failure prediction of earth structures. 4,604,706, Cl. 364-507.000.
Fisher, Joseph D.; and Huang, Chin C., to Armour Pharmaceutical Company. Preparation of pasteurized human plasminogen. 4,604,358, Cl. 435-217.000.
Fisher, Leo; and Weiser, Atilla, to Teledyne Industries, Inc. Dental appliance. 4,604,058, Cl. 433-127.000.
Fitzpatrick, Michael H., to Northern Telecom Limited. Connector shroud. 4,603,929, Cl. 339-17.00C.
Flashner, Michael, to J. T. Baker Chemical Company. Purification of monoclonal antibodies. 4,604,235, Cl. 530-387.000.
Flautt, Martin C.: *See*—
Pollet, Jean-Claude; Armstrong, Gordon P.; and Flautt, Martin C., 4,604,325, Cl. 428-391.000.
Flerov, Valery N.: *See*—
Naumov, Jury I.; Juzefovich, Dmitry K.; Epifanova, Valentina S.; Kucherenko, Vladimir I.; Flerov, Valery N.; Praporov, Anatoly M.; Shustov, Vladimir P.; Sychev, Alexel E.; Korolev, Georgy V.; Kotov, Evgeny P.; and Derevyanko, Yan N., 4,604,175, Cl. 204-151.000.
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Borcherdt, Roger D.; Fletcher, Jon P.; Warrick, Richard E.; Maxwell, Gary L.; Jensen, Edward G.; and Schaack, John V., 4,604,699, Cl. 364-420.000.
Flo-Con Systems, Inc.: *See*—
King, Patrick D., 4,603,842, Cl. 266-44.000.
Florin, Wolfram: *See*—
Hoffken, Erich; Florin, Wolfram; and Hammer, Rudolf, 4,604,138, Cl. 75-51.600.
Focke & Co., (GmbH & Co.): *See*—
Focke, Heinz, 4,603,534, Cl. 53-231.000.
Focke, Heinz; and Liedtke, Kurt, 4,603,800, Cl. 226-119.000.
Focke, Heinz, to Focke & Co., (GmbH & Co.). Apparatus for wrapping articles, especially cigarette groups. 4,603,534, Cl. 53-231.000.
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Folkins, Jeffrey J., to Xerox Corporation. Development system. 4,603,961, Cl. 355-3.0DD.
Fong, Dodd W.; and Halverson, Ann M., to Nalco Chemical Company. Polymers of 1-acryloyl-4-methyl piperazine, methyl chloride or sulfate quaternary salts as flocculants. 4,604,213, Cl. 210-735.000.
Fong, Dodd W.; Pierce, Claudia C.; and Grattan, David A., to Nalco Chemical Company. Chemical modification of (meth)acrylic acid homopolymers and alkyl (meth)acrylate polymers in aqueous systems with amino sulfonic acids. 4,604,431, Cl. 525-351.000.
Fonvielle, Frank P.: *See*—
Kacicz, Joseph M.; and Fonvielle, Frank P., 4,604,366, Cl. 501-6.000.
Formost Packaging Machines, Inc.: *See*—
Pace, Vincent C., 4,603,537, Cl. 53-415.000.
Fosnaught, Harold R., to Owens-Illinois, Inc. Apparatus and method for guiding plastic labels to a label-wrapping station. 4,604,154, Cl. 156-264.000.
Fosse, John S.: *See*—
Vilona, James J., 4,603,995, Cl. 402-73.000.
Foti, William T.: *See*—
Hinton, John H.; Foti, William T.; and Giguere, Philip J., 4,603,963, Cl. 355-8.000.
Foulke, Richard F.; and Winchell, Kenneth A., to Poconics International, Inc. Vacuum pickup apparatus. 4,603,897, Cl. 294-64.100.
Fourreaux, Gerard D.: *See*—
Delon, Patrice C. G.; Fourreaux, Gerard D.; Nicolas, Michel J. R.; and Sebilet, Bruno R., 4,604,622, Cl. 343-5.0PD.
Fox, David H.; and Robinson, Lonnie, to GTE Products Corporation. Incandescent lamp mount structure with shield for evaporation products. 4,604,546, Cl. 313-272.000.
Franchi, Ernest J., to United States of America, Army. Positive action release mechanism. 4,604,608, Cl. 340-540.000.
Francis, John F., to Gillette Company, The. Safety razors. 4,603,477, Cl. 30-50.000.
Franck, Klaus, to Wilkhahn Wilkening and Hahne GmbH & Co. Spring mounting apparatus. 4,603,830, Cl. 248-575.000.
Francoeur, Ronald A.; and Schellhorn, Verne L. Method and apparatus for retensioning prestressed concrete members. 4,604,003, Cl. 405-256.000.
Franko, Bernard V.: *See*—
Leonard, Charles A.; Franko, Bernard V.; and Cale, Albert D., Jr., 4,604,388, Cl. 514-211.000.
Frano, Francis G., to Illinois Tool Works Inc. Pallet fastener. 4,604,014, Cl. 411-338.000.
Frappier, David E.: *See*—
Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., 4,604,302, Cl. 427-208.600.
Frazer, Stephen O.; and Riddiford, Martin P., to Price/Stern/Sloan Publishers, Inc. Teaching or amusement apparatus. 4,604,065, Cl. 434-331.000.
Frazier, Stephen E., to General Time Corporation. Filter element, filter, and method for removing odors from indoor air. 4,604,110, Cl. 55-74.000.
Freller, Helmut: *See*—
Mund, Konrad; Freller, Helmut; and Hoerauf, Friedrich, 4,603,704, Cl. 128-784.000.
Frencken, Peter H.; Raven, Johannes G.; and Annegarn, Marcellinus J. J. C., to U.S. Philips Corporation. Television circuit arrangement for field and line frequency doubling and picture part magnification. 4,604,651, Cl. 358-140.000.
Freudenschuss, Otto: *See*—
Rollenitz, Leopold; Schmidt, Harald; Freudenschuss, Otto; and Morell, Josef, 4,603,811, Cl. 239-90.000.
Friedberger, Michael P.: *See*—
Thomas, Robert H., deceased; Mary A. Thomas, executrix; Hammond, Willis B.; Friedberger, Michael P.; and Archie, William A., 4,604,316, Cl. 428-265.000.
Friendship, Kenneth F. M.: *See*—
Krishnakumar, Suppayan M.; Friendship, Kenneth F. M.; Mahajan, Gautam K.; and Pocock, John F. E., 4,603,831, Cl. 249-144.000.
Frigoscandia Contracting AB: *See*—
Olsson, Lennart, 4,603,776, Cl. 198-778.000.
Frolov, Alexandr D.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.
Frost, Charles W.: *See*—
Kimball, David V.; and Frost, Charles W., 4,603,587, Cl. 73-663.000.
Frost, Wendell: *See*—
Benn, George; Frost, Wendell; Knudsen, Chris; and Nieuwsma, David, 4,604,711, Cl. 364-900.000.
Frye, Ricky F.: *See*—
Conley, Ralph F., Jr.; and Frye, Ricky F., 4,603,647, Cl. 112-129.000.
Fuchs, Dieter; and Schmitt, Wolfgang, to Weissenfeld-Richters, H. Shaft and radially-sealing ring with cold flexed seal disk. 4,603,866, Cl. 277-152.000.
Fuchs, Erwin: *See*—
Rungger, Helmut; Fuchs, Erwin; and Knoll, Johann, 4,604,011, Cl. 409-138.000.
Fujawa, Charles S.; and Masteller, Sara B., to Allied Corporation. Fail-soft turbocharger control system. 4,604,701, Cl. 364-431.010.
Fuji Koko Co., Ltd.: *See*—
Tsuji, Shinsaku; Kimura, Toshimitsu; Asano, Yasushi; and Suzuki, Yasuhito, 4,603,598, Cl. 74-473.00P.

Fuji Photo Film Co., Ltd.: *See*—
Aonuma, Masashi; and Tamai, Yasuo, 4,604,296, Cl. 427-57.000.
Arai, Fuminori; Tanaka, Mitsutoshi; and Katsuyama, Harumi, 4,604,347, Cl. 435-4.000.
Kitada, Akira; Yamazaki, Kikuo; and Yamazaki, Hisashi, 4,604,525, Cl. 250-363.00R.
Oishi, Kengo, 4,604,671, Cl. 360-132.000.
Shirahata, Ryuji; and Yanai, Akio, 4,604,293, Cl. 427-42.000.
Sugimoto, Tadao; Ikeda, Hideo; Mifune, Hiroyuki; and Nakamura, Koki, 4,604,339, Cl. 430-244.000.
Terashita, Takaaki, 4,603,969, Cl. 355-77.000.

Fuji Xerox Co., Ltd.: *See*—
Aota, Koichi; Ishikawa, Katsuhiko; and Yokoi, Naoki, 4,603,970, Cl. 355-133.000.
Suganuma, Saburo; and Kataoka, Hiroyuki, 4,604,696, Cl. 364-401.000.

Fujie, Masakatsu: *See*—
Kamajima, Kohji; Nakano, Yoshiyuki; Fujie, Masakatsu; Hosoda, Yuji; Iwamoto, Taro; and Honma, Kazuo, 4,604,561, Cl. 318-567.000.

Fujii, Kiyonobu: *See*—
Ueeda, Ryuhei; Fujii, Kiyonobu; and Narukawa, Hiroshi, 4,604,441, Cl. 526-351.000.

Fujii, Setsuro; Chikazawa, Nobumoto; Arima, Teruo; and Fukushima, Masakazu, to Sanwa Kagaku Kenyusho Co., Ltd. Protein having cell growth stimulating action, composition thereof and method for producing the same. 4,604,234, Cl. 514-2.000.

Fujii, Toshifumi, to Mitsubishi Denki Kabushiki Kaisha. Tape stop position detecting apparatus and magnetic video reproducing apparatus using the same. 4,604,656, Cl. 360-10.100.

Fujii, Yoshimasa; Mitsuhashi, Yoshinobu; and Koike, Osamu, to Agency of Industrial Science and Technology; and Hoya Corporation. Polarization-maintaining fiber system and method of manufacturing the same. 4,603,941, Cl. 350-96.150.

Fujikura, Yoshiaki; Kajihara, Yasushi; Takaishi, Naotake; Inamoto, Yoshiaki; Kimura, Akio; Nakajima, Motoki; and Miyamoto, Norioki, to Kao Corporation. Cyclohexanol derivatives and fragrance compositions containing the same. 4,604,488, Cl. 568-820.000.

Fujimaki, Tatsuo: *See*—
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, 4,603,722, Cl. 152-209.00R.

Fujimatsu, Masaaki; and Kobashi, Toshiyuki, to Japan Exlan Company Limited. Method of producing a flame-retardant acrylic polymer. 4,604,428, Cl. 525-276.000.

Fujinami, Hiroshi: *See*—
Otsuki, Hiromi; Matsuura, Ryoichi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,603,920, Cl. 303-10.000.

Fujisawa Pharmaceutical Company, Limited: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,604,456, Cl. 540-222.000.

Fujitsu Limited: *See*—
Horiuchi, Akinori; Binnaka, Toshio; and Maruyama, Shigeyuki, 4,604,572, Cl. 324-158.00F.
Kimoto, Masayoshi, 4,604,729, Cl. 365-190.000.
Matsui, Shougo, 4,603,974, Cl. 356-394.000.
Murakami, Joji, 4,604,692, Cl. 364-200.000.
Okajima, Yoshinori, 4,604,728, Cl. 365-189.000.
Tone, Hirosada, 4,604,688, Cl. 364-200.000.
Watanabe, Hisashi, 4,604,495, Cl. 174-52.0FP.
Yoshida, Masanobu; and Itano, Kiyoshi, 4,604,730, Cl. 365-200.000.

Fujiwara, Haruyoshi; and Makino, Tetsuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Flow restraining elements in the headbox of a paper machine. 4,604,164, Cl. 162-343.000.

Fujiwara, Kenzou: *See*—
Murasato, Shigeru; Nakanishi, Yuji; Fujiwara, Kenzou; Takeuchi, Norio; and Horita, Tsuyoshi, 4,604,541, Cl. 310-180.000.

Fukami, Akira: *See*—
Kobayashi, Yutaka; Fukami, Akira; and Suzuki, Takaya, 4,604,159, Cl. 156-617.00R.

Fukami, Tadashi, to Oken Seiko Co., Ltd. Coreless motor, and a method for manufacturing the coreless motor. 4,604,540, Cl. 310-154.000.

Fukami, Tadashi; and Odaka, Kentaro, to Sony Corporation. Apparatus for processing PCM signal. 4,604,657, Cl. 360-32.000.

Fukaya, Chikara: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,604,385, Cl. 514-183.000.

Fukazawa, Takao: *See*—
Jinnai, Koichiro; Fukazawa, Takao; Ito, Tadashi; Koike, Takahisa; Murai, Toshiharu; and Ishima, Kazumi, 4,604,631, Cl. 346-1.100.

Fukuda, Hirosuke: *See*—
Seno, Taiko; Okubo, Yasuto; Kawamura, Masao; Akutsu, Seiichi; and Fukuda, Hirosuke, 4,604,349, Cl. 435-15.000.

Fukuda, Takashi: *See*—
Aida, Akira; Ohno, Tetsu; Fukuda, Takashi; Aihara, Kenji; Mizoguchi, Takuo; Nishimura, Syozi; and Kajiyama, Katsuyoshi, 4,604,146, Cl. 148-12.00B.

Fukuda, Yukihiro: *See*—
Nishikawa, Masao; Sakai, Shinzo; Sato, Yoichi; and Fukuda, Yukihiro, 4,603,601, Cl. 74-731.000.
Nishikawa, Masao; Sato, Yoichi; and Fukuda, Yukihiro, 4,603,604, Cl. 74-869.000.

Fukushima, Masakazu: *See*—
Fujii, Setsuro; Chikazawa, Nobumoto; Arima, Teruo; and Fukushima, Masakazu, 4,604,234, Cl. 514-2.000.

Funahashi, Yasuhiro, to Brother Kogyo Kabushiki Kaisha. Image reproduction interface. 4,604,615, Cl. 340-750.000.

Furnish, Gregory R.: *See*—
Grimsley, Richrd L.; and Furnish, Gregory R., 4,604,529, Cl. 307-10.00R.

Furukawa Electrical Company, Ltd.: *See*—
Shiga, Shoji; Hayakawa, Takayuki; and Kamiyama, Yasuo, 4,604,169, Cl. 204-34.000.

Furukawa, Koichi: *See*—
Kuranishi, Masaaki; Nonaka, Susumu; Furukawa, Koichi; and Siozaki, Fumio, 4,603,987, Cl. 400-639.100.

Futagami, Mikio: *See*—
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Futagami, Mikio, 4,604,414, Cl. 524-139.000.

Fuwa, Yasushi, to Mitsubishi Denki Kabushiki Kaisha. Change-over switch for an on-load tap changer. 4,604,503, Cl. 200-11.0TC.

G.B. Boucherie, Firma: *See*—
Boucherie, Leonel P., 4,603,912, Cl. 300-2.000.

G-C Dental Industrial Corp.: *See*—
Kamohara, Hiroshi; Hayashi, Shohei; and Ohi, Nobukazu, 4,604,142, Cl. 106-38.510.

G & H Technology, Inc.: *See*—
Burns, Edgar, 4,603,934, Cl. 339-90.00R.

G. W. Lisk Company, Inc.: *See*—
Clark, Bruce D., 4,604,600, Cl. 335-261.000.

GA Technologies Inc.: *See*—
Moeller, Charles P., 4,604,551, Cl. 315-4.000.
Olsen, Randall B., 4,603,731, Cl. 165-41.000.

Gach, Peter P., to Sunbeam Plastics Corp. Tamper indicating closure. 4,603,785, Cl. 215-230.000.

Gagliani, John; and Long, John V. Polyamide-imide foams and methods of making same. 4,604,409, Cl. 521-157.000.

Gakei Electric Works Co., Ltd.: *See*—
Nishizawa, Minoru, 4,604,262, Cl. 422-310.000.

Gallia, James D.: *See*—
Shah, Ashwin H.; Chatterjee, Pallab K.; Gallia, James D.; and Mahant-Shetti, Shivaling S., 4,604,727, Cl. 365-189.000.

Gallo, Joseph S., Sr. Bow winder. 4,603,797, Cl. 223-46.000.

Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., to Moskovskoe Vysshee Tekhnicheskoe Uchilische Imeni N.E. Baumana; and Zavod-Vtuz Pri Moskovskom Avtomobilnom Zavode Imeni I.A. Likhacheva. Press. 4,603,573, Cl. 72-454.000.

Gandini, Marco; and Sartori, Mario, to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A. Digital transceiver for full-duplex transmission of binary signals over a common line. 4,604,740, Cl. 370-27.000.

Gans, Michael J.: *See*—
Amitay, Noach; and Gans, Michael J., 4,604,624, Cl. 343-361.000.

Garber Company, The: *See*—
Meyers, George; and Mueller, David C., 4,603,779, Cl. 206-426.000.

Gardner, John R., to Rogers Corporation. Surface mounted bussing device. 4,603,927, Cl. 339-17.00C.

Garnsey, Roger L. Collapsible structure. 4,603,658, Cl. 119-19.000.

Garrett Corporation, The: *See*—
Wan, Chung-Chu; and Brown, Glenn W., 4,603,801, Cl. 228-194.000.

Gartner, Gunter: *See*—
Luz, Rudolf; and Gartner, Gunter, 4,603,818, Cl. 242-35.50A.

Gas Research Institute: *See*—
Davies, Theodore E.; Quinn, Dennis E.; and Watson, James E., 4,604,051, Cl. 431-166.000.

Gates Rubber Company, The: *See*—
Krause, Keith M., 4,603,712, Cl. 138-137.000.

Gauronski, John F.: *See*—
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GCA Corporation: *See*—
Morley, Morgan J., 4,603,466, Cl. 29-569.00R.

Gearhart Industries, Inc.: *See*—
Stoltz, John W., 4,603,578, Cl. 73-151.000.

Gebhardt Fordertechnik GmbH: *See*—
Felder, Christian, 4,603,771, Cl. 198-367.000.

Gebhardt, Wallace E., to Switches, Inc. Self-adjusting switch mechanism. 4,604,506, Cl. 200-61.890.

Geimuplast Peter Mundt GmbH & Co. KG.: *See*—
Mussig, Herbert; and Pohl, Claus, 4,603,539, Cl. 53-435.000.

Geller, Robert F.: *See*—
Blount, Frederick T.; Capowski, Robert S.; Casper, Daniel F.; DelSonno, Lawrence R.; Geller, Robert F.; Kusmiss, Joseph M.; and Zimmerman, Terrence K., 4,604,709, Cl. 364-900.000.

Gen, Shokyu: *See*—
Ikada, Yoshito; Gen, Shokyu; Shimizu, Yasuhiko; Tamura, Koichi; Nakamura, Tatsuo; Kimura, Sosuke; Cho, Tsuneo; Tadokoro, Hideki; and Hori, Kazuaki, 4,603,695, Cl. 128-334.00R.

Genentech, Inc.: *See*—
Goeddel, David V.; and Heyneker, Herbert L., 4,604,359, Cl. 435-253.000.
General Aero Products Corp.: *See*—
Reiter, Eli; and Robson, Joseph R., 4,603,542, Cl. 53-585.000.
General Battery Corporation: *See*—
Windisch, Lawrence; Nees, John; and Channing, Harry, 4,604,564, Cl. 320-2.000.
General Dynamics Corporation: *See*—
Paciorek, Peter M., 4,603,452, Cl. 16-262.000.
General Dynamics, Pomona Division: *See*—
Chang, Yu-Wen; Kan, Phillip T.; and Ross, Oakley G., 4,603,942, Cl. 350-96.240.
Thorpe, Richard W., 4,604,570, Cl. 324-73.00R.
General Electric Company: *See*—
Alley, Robert P.; Huber, Paul G.; and Sullivan, Joseph M., 4,604,552, Cl. 315-176.000.
Ashley, Eugene, 4,603,615, Cl. 89-7.000.
Kosmach, Jerry C., 4,604,553, Cl. 313-315.000.
Liu, Ping Y., 4,604,423, Cl. 524-508.000.
Payne, Thomas R., 4,604,518, Cl. 219-506.000.
Peele, James C., 4,604,647, Cl. 358-65.000.
Rich, Jonathan D., 4,604,442, Cl. 528-28.000.
Rich, Jonathan D., 4,604,477, Cl. 556-436.000.
Rosenquist, Niles R., 4,604,434, Cl. 525-462.000.
Schoendube, Charles W., 4,604,673, Cl. 361-38.000.
Shepard, Neal F., Jr., 4,604,494, Cl. 136-246.000.
Siemers, Paul A.; Jackson, Melvin R.; and Rutkowski, Stephen F., 4,603,568, Cl. 72-47.000.
Toutant, Roy T.; and Lozinski, Gerald J., 4,604,715, Cl. 364-513.000.
Yeaple, Thomas L.; Wagner, James B.; and Hall, Donald H., 4,604,028, Cl. 415-38.000.
General Kinematics Corporation: *See*—
Musschoot, Albert, 4,604,023, Cl. 414-375.000.
General Motors Corporation: *See*—
Bien, Paul R., 4,603,865, Cl. 277-12.000.
Brown, Trevor J.; and Dipzinski, Eugene S., 4,603,914, Cl. 301-37.00P.
Edwards, David K.; and Kramer, John H., 4,604,024, Cl. 414-592.000.
Espinoza, John A.; Konchan, Jeffrey L.; and Rimbey, Ronald P., 4,603,877, Cl. 280-807.000.
Liu, Sonya W.; and Lindsay, James H., 4,604,168, Cl. 204-30.000.
Loose, Richard D.; and Struck, Joseph W., 4,603,819, Cl. 242-107.40A.
Merrill, Thomas A.; and Martin, Donald A., 4,604,538, Cl. 310-68.00D.
Myers, William K., 4,603,760, Cl. 188-73.370.
Osenkowski, Joseph M., 4,603,894, Cl. 292-216.000.
Salmon, Michael E., 4,603,603, Cl. 74-868.000.
General Time Corporation: *See*—
Frazier, Stephen E., 4,604,110, Cl. 55-74.000.
Generale des Engrais S.A.: *See*—
Moraillon, Philippe, 4,604,126, Cl. 71-34.000.
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Rossfelder, Andre M.; and Jung, Peter A., 4,603,748, Cl. 175-19.000.
Gerber, Dennis H., to Burke Industries, Inc. Tensioned reservoir cover, rainwater run-off enhancement system. 4,603,790, Cl. 220-219.000.
Gerber Garment Technology, Inc.: *See*—
Pearl, David R.; and Wolfson, Lawrence S., 4,603,777, Cl. 198-803.800.
Gerdes, Harold M.: *See*—
Bryant, Charles P.; and Gerdes, Harold M., 4,604,221, Cl. 252-51.50A.
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Gerin, Merlin: *See*—
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Gersbach, John E.; and Moser, John J., to International Business Machines Corporation. Imbalance circuits for DC testing. 4,604,531, Cl. 307-445.000.
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Ghelardoni, Mario: *See*—
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Gilbert, Barrie, to Analog Devices, Incorporated. Temperature compensated logarithmic circuit. 4,604,532, Cl. 307-490.000.
Gile, Richard H.; and Bourgoine, Edward C. Orthogonal dressing of grinding wheels. 4,603,677, Cl. 125-11.00R.
Gillespie, Arthur B.: *See*—
Watkins, Roger D.; Gillespie, Arthur B.; Deighton, Michael O.; Pike, Roger B.; and Scott-Kestin, Colin B., 4,604,612, Cl. 340-582.000.
Gillette Company, The: *See*—
Francis, John F., 4,603,477, Cl. 30-50.000.
Gilmore, Robert L.; and Lander, George E., to United States of America, Air Force. Vacuum blast adapter for bombs. 4,603,515, Cl. 51-424.000.
Giocastro, Joseph. Rockerarm system for controlling valves in an internal combustion engine. 4,603,663, Cl. 123-90.170.
Girsberger Aktiengesellschaft: *See*—
Stucki, Felix, 4,603,905, Cl. 297-300.000.
GKN Birwelco Limited: *See*—
Coulthard, Leslie M. F., 4,604,047, Cl. 431-5.000.
Glaenzer Spicer: *See*—
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Glaspie, Donald L.: *See*—
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Glass, Michael; Hoholick, Joseph; Oppenheimer, Alfred; and Dombroski, Amy, to Warner-Lambert Company. Multiple textured chewing gum. 4,604,287, Cl. 426-5.000.
Glass, Michael; Corsello, Vincent; Orlandi, Daniel A.; and Guzowski, Anthony, to Warner-Lambert Company. Process for preparing a chewing gum composition with improved flavor perception. 4,604,288, Cl. 426-5.000.
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Strauss, Gottfried, 4,604,124, Cl. 65-273.000.
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Wetmore, Sherman B., 4,604,001, Cl. 405-224.000.
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Godard, Dominique; and Morlec, Emile, to International Business Machines Corp. Tone detector and multifrequency receiver using said detector. 4,604,713, Cl. 364-484.000.
Godfrey, Jollie D., Jr.; Gordon, Eric M.; and Natarajan, Sesha I., to E. R. Squibb & Sons, Inc. Hydroxy substituted ureido amino and imino acids. 4,604,402, Cl. 514-333.000.
Godfrey, Richard. Ball valve with preloaded seals and method of manufacture. 4,603,836, Cl. 251-315.000.
Goeddel, David V.; and Heyneker, Herbert L., to Genentech, Inc. Microbial expression of quasi-synthetic genes. 4,604,359, Cl. 435-253.000.
Goldberg, Michael. Heat pump closed loop drying. 4,603,489, Cl. 34-77.000.
Goldberg, Michael S., to Teepak, Inc. Food casing which will transfer a smoke color to food encased therein and extracted natural liquid smoke colorant for use therewith. 4,604,309, Cl. 428-36.000.
Golden, James M. Apparatus for removing internal tiles from chimneys. 4,603,747, Cl. 173-94.000.
Golomb, John C., to Everlast World's Boxing Headquarters Corp. Boxing glove. 4,603,439, Cl. 2-18.000.
Golovin, Vasily Y.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.
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Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., 4,604,724, Cl. 364-478.000.
Gomez, I. Luis, to Monsanto Company. Process for forming plasticized polyvinyl butyral interlayers. 4,604,253, Cl. 264-211.000.
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Goodall, Richard L.; and Singh, Paramjit, to Dixon Valve & Coupling Company. End fitting. 4,603,888, Cl. 285-55.000.
Goodman, Maxine: *See*—
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Mehltretter, James C.; Woodard, Winfred L., III; Orlando, John J.; and Goodrich, Charles B., 4,603,814, Cl. 241-30.000.
Goodwater, Harry C. Apparatus and method for multiple mode remote control switching. 4,604,619, Cl. 340-825.180.
Goodyear Tire & Rubber Company, The: *See—*
Broyles, Henry D., 4,604,158, Cl. 156-403.000.
Colvin, Howard A.; Cottman, Kirkwood S.; and Parker, Dane K., 4,604,439, Cl. 526-288.000.
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Goss, Raymond W., to Hercules Incorporated. Precoat resin dispersion for tufted carpets. 4,604,311, Cl. 428-96.000.
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Gotch, H., to Grundy (Teddington) Limited. Ball valve seat. 4,603,838, Cl. 251-361.000.
Gottfried, Robert W.: *See—*
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Granryd, Thorvald G. Lightweight retractable track-wheel for agricultural tractors and the like. 4,603,916, Cl. 301-45.000.
Grant, George A.: *See—*
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Grauel, Ingolf; Kulke, Gunter; Muller, Egbert; and Stumpe, Werner, to Robert Bosch GmbH. Dual control pressure medium brake system. 4,603,919, Cl. 303-6.00R.
Graves, George A., Jr.; and Kumar, Binod, to University of Dayton. Bioabsorbable glass fibers for use in the reinforcement of bioabsorbable polymers for bone fixation devices and artificial ligaments. 4,604,097, Cl. 623-11.000.
Gray, Joseph H., to TRW Inc. Computer and method for high speed prime factor transform. 4,604,721, Cl. 364-726.000.
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Greenberg, Robert, to Bobrick Washroom Equipment, Inc. Sheet metal mounting device. 4,603,827, Cl. 248-542.000.
Greenblatt, Abraham J. Motorized nutcracker. 4,603,624, Cl. 99-572.000.
Greenlaw, John W.; Schlueter, Gary R.; and Kettlitz, Karsten, to Kettlitz, Karsten; and Schlueter, Gary. Optical device for an individual. 4,603,944, Cl. 350-252.000.
Greenwood, Alan; and Majerus, Norbert, to Goodyear Tire & Rubber Company, The. Process and apparatus for injection molding tire treads. 4,604,256, Cl. 264-501.000.
Greenwood, Eugene C. Continuous passive motion orthopedic device. 4,603,687, Cl. 128-25.00R.
Gregoire, Roger J.; and Huling, Bruce, to Motorola, Inc. Purge block for gas systems. 4,603,707, Cl. 137-557.000.
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Gresham, Anne L. Hoof conditioner and dressing and methods of use. 4,604,283, Cl. 424-80.000.
Grimm, Duane H., to Sundstrand Corporation. Fail safe actuator. 4,603,594, Cl. 74-89.150.
Grimsley, Richrd L.; and Furnish, Gregory R., to Cincinnati Microwave, Inc. Radar warning receiver with power plug. 4,604,529, Cl. 307-10.00R.
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Griswold, Wayne D. Car top carrier. 4,603,798, Cl. 224-310.000.
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Grollier, Jean-Francois; and Allec, Josiane, to L'Oreal. Capillary cosmetic composition containing a sarsaparilla extract. 4,604,282, Cl. 424-74.000.
Grossa, Mario, to Du Pont de Nemours, E. I., and Company. Negative-toning imaging system with re-imaging capability using 4-(2'-nitrophenyl)-1,4-dihydropyridine compounds. 4,604,340, Cl. 430-270.000.
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Gruber, Robert J.; Yourd, Raymond A., III; and Koch, Ronald J., to Xerox Corporation. Positively charged colored toner compositions. 4,604,338, Cl. 430-106.000.
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GTE Laboratories Incorporated: *See—*
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Douglas, Alan D.; Reilly, Kenneth T.; Landmesser, John E.; Landry, Richard E.; and MacInnis, Martin B., 4,604,265, Cl. 423-49.000.
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Levin, Robert E.; and English, George J., 4,604,680, Cl. 362-293.000.
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Guinn, Douglas B., to Outboard Marine Corporation. Marine propulsion device lower unit including propeller bearing member anode. 4,604,068, Cl. 440-76.000.
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Gunnarsson, Tord S., to U.S. Philips Corporation. Tunable magnetron with internal tuning motor. 4,604,587, Cl. 331-90.000.
Gunther, Dieter: *See*—
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Gunther, Robert C. Weather stop. 4,603,508, Cl. 49-493.000.
Gurmarnik, Simon. System for and a method of translation. 4,604,063, Cl. 434-157.000.
Gutierrez, D. Arturo M. Perfume dispensing device. 4,604,245, Cl. 261-26.000.
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Guttmann Cherniak, Jaime. System of podiatric appliances independently adjustably securable on inner sole-like base plate. 4,603,698, Cl. 128-603.000.
Guzowski, Anthony: *See*—
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Hafele, Robert X., to Hoover Universal, Inc. Injection blow molding apparatus. 4,604,044, Cl. 425-525.000.
Haferl, Peter E., to RCA Corporation. Television receiver load compensation circuit. 4,604,556, Cl. 315-411.000.
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Hagner, George R., to Parker, Frederick. Circuit board with high density electrical tracers. 4,604,678, Cl. 361-401.000.
Haikawa, Yukihiko: *See*—
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Halbmann, Manfred, to Linde Aktiengesellschaft. Refrigerated-goods display case. 4,603,557, Cl. 62-255.000.
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Hall, Luke; and Multop, Jerry M., to Progressive Technology, Inc. Cutting tool. 4,604,007, Cl. 409-89.000.
Hallford, Ben R., to Rockwell International Corporation. Microwave plug-in signal amplifying module. 4,604,585, Cl. 330-286.000.
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Hamada, Akio. Fire escape descender. 4,603,759, Cl. 182-234.000.
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Hambrecht, Juergen; Illers, Karl-Heinz; Echte, Adolf; and Swoboda, Johann, to BASF Aktiengesellschaft. Thermoplastic molding materials. 4,604,415, Cl. 524-140.000.
Hamel, Richard G., to Westinghouse Electric Corp. Reclosing relay apparatus. 4,604,674, Cl. 361-73.000.
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Hammoud, Ezzat A., to Dresser Industries, Inc. Position indicator for a material handling element of a machine. 4,604,025, Cl. 414-698.000.
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Hanagan, Mary A., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,604,131, Cl. 71-90.000.
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Haneishi, Yasuyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Data transmission between interchangeable lens and a camera body. 4,603,955, Cl. 354-286.000.
Haney, James P. Portable bait container. 4,603,503, Cl. 43-56.000.
Hannan, Peter W., to Hazeltine Corporation. Axial conductance angular filter. 4,604,629, Cl. 343-909.000.
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Hengle, Robert E.; and Granfors, William F., to FECO Engineered Systems, Inc. Reversible cross flow drying or curing oven. 4,603,491, Cl. 34-191.000.
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Heverly, Karen H. Electrical outlet cover. 4,603,932, Cl. 339-39.000.
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Hinman, P. Anthony, to Hitco. Furan reimpregnation resin. 4,604,432, Cl. 525-389.000.
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Hirayama, Takeshi: *See*—
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Hirukawa, Yohichi; Nozaki, Toshiyuki; and Hosokawa, Naokichi, to Anelva Corporation. Target assembly capable of attaining a high step coverage ratio in a magnetron-type sputtering device. 4,604,180, Cl. 204-298.000.
Hitachi, Ltd.: *See*—
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Hoechst CeramTec AG: *See*—
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Hoerauf, Friedrich: *See*—
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Hoffken, Erich; Florin, Wolfram; and Hammer, Rudolf, to Thyssen Stahl AG. Process for refining hot metal. 4,604,138, Cl. 75-51.600.

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Hoffman, Joseph H., to Resource Engineering and Manufacturing Corp. Self propelled pipe blast cleaner capable of travel along a pipeline supported over the ditch. 4,603,516, Cl. 51-425.000.

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Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,604,284, Cl. 424-85.000.

Hofmann, Heinrich; and Markfelder, Gunter, to FAG Kugelfischer Georg Schafer (KgaA). Axial shift arrangement for two-row angular-contact bearing. 4,603,983, Cl. 384-512.000.

Hohmann, Lothar M.: *See*—
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Hoholick, Joseph: *See*—
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Honeywell Inc.: *See*—
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Staplin, Theodore R., Jr.; Bradley, John J.; and Stoffers, Brian L., 4,604,722, Cl. 364-736.000.
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Honma, Kazuo: *See*—
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Hopkins, Gerard T.: *See*—
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Hori, Kazuaki: *See*—
Ikada, Yoshito; Gen, Shokyu; Shimizu, Yasuhiko; Tamura, Koichi; Nakamura, Tatsuo; Kimura, Sosuke; Cho, Tsuneo; Tadokoro, Hideki; and Hori, Kazuaki, 4,603,695, Cl. 128-334.00R.

Hori, Shinichi: *See*—
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Horie, Tuneo; Ozaki, Shiyozi; and Takeuti, Takikazu, to Hitachi, Ltd. Method and circuit for correcting a record timing. 4,604,660, Cl. 360-45.000.

Horinishi, Katsumi: *See*—
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Horita, Tsuyoshi: *See*—
Murasato, Shigeru; Nakanishi, Yuji; Fujiwara, Kenzou; Takeuchi, Norio; and Horita, Tsuyoshi, 4,604,541, Cl. 310-180.000.

Horiuchi, Akinori; Binnaka, Toshio; and Maruyama, Shigeyuki, to Fujitsu Limited. Device for testing semiconductor devices at a high temperature. 4,604,572, Cl. 324-158.00F.

Horiuchi, Tatumi, to Konishiroku Photo Industry Co., Ltd. Controlling method for a sorter. 4,603,850, Cl. 271-288.000.

Horner, John A. Patient operated device and method for applying traction to the lower back vertebra of a patient in a seated position. 4,603,689, Cl. 128-75.000.

Horton, George R.: *See*—
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Hosoda, Yuji: *See*—
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Hough, Roger E., to International Business Machines Corporation. Shared and exclusive access control. 4,604,694, Cl. 364-200.000.

Hounsell, Melvin W. Culture transport apparatus. 4,604,360, Cl. 435-287.000.

Howard, Clyde: *See*—
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Hoya Corporation: *See*—
Fujii, Yoshimasa; Mitsuhashi, Yoshinobu; and Koike, Osamu, 4,603,941, Cl. 350-96.150.

Hoya, Takesi. Slurry pumping apparatus for solid-liquid separation. 4,604,037, Cl. 417-394.000.

Hsu, Shih C., to GTE Laboratories Incorporated. Flexible permeable valve for melt spinning process. 4,603,727, Cl. 164-133.000.

Huang, Chin C.: *See*—
Fisher, Joseph D.; and Huang, Chin C., 4,604,358, Cl. 435-217.000.

Huang, Yen-Ching; and Nikaido, Hideyasu, to Tokai University; and Sumitomo Metal Mining Company Limited. Method for manufacture of aluminum-coated lead frame. 4,604,291, Cl. 427-37.000.

Huber, Paul G.: *See*—
Alley, Robert P.; Huber, Paul G.; and Sullivan, Joseph M., 4,604,552, Cl. 315-176.000.

Hubner, Heinz-Joachim: *See*—
Pfannenstiel, Hubert; and Hubner, Heinz-Joachim, 4,603,726, Cl. 164-35.000.

Huffman, William F.: *See*—
Callahan, James F.; Huffman, William F.; Moore, Michael L.; and Yim, Nelson C., 4,604,378, Cl. 514-11.000.

Hughes Aircraft Company: *See*—
Cinzori, Robert J., 4,603,975, Cl. 356-152.000.

Hughes, Lawrence R., to Hughes, Raymond F. Computer telephone access security processor. 4,604,499, Cl. 179-2.0DP.

Hughes, Raymond F.: *See*—
Hughes, Lawrence R., 4,604,499, Cl. 179-2.0DP.

Hughes, Robert E.: *See*—
Moroney, William F.; Bartholomew, James C.; Cagle, Clifford M.; and Hughes, Robert E., 4,603,486, Cl. 33-512.000.

Hughes Tool Company: *See*—
Edgmon, John W., 4,603,741, Cl. 166-369.000.
Smith, Roger, Jr.; and Hebard, Harry D., 4,603,464, Cl. 29-428.000.

Hughes Tool Company - USA: *See*—
Sorenson, Robert B., 4,603,750, Cl. 175-340.000.

Huisma, Camiel, to Oy Wartsila AB. Device in a vacuum transportation system for liquids, preferably a vacuum sewage system. 4,603,709, Cl. 137-205.000.

Huling, Bruce: *See*—
Gregoire, Roger J.; and Huling, Bruce, 4,603,707, Cl. 137-557.000.

Hults, Gerald J.: *See*—
Cross, Thomas E., Jr.; and Hults, Gerald J., 4,603,696, Cl. 128-419.00P.

Humber, Leslie G.: *See—*
Demerson, Christopher A.; and Humber, Leslie G., 4,604,469, Cl. 548-432.000.

Humphreys, Robert W. R., to Loctite Corporation. Visible light absorbing peroxy-esters. 4,604,295, Cl. 427-54.100.

Hundt, Werner; and Wagner, Bernd, to Metzeler Kautschuk GmbH. Support ring for a torsional vibration balancer which can be fastened to a shaft. 4,603,997, Cl. 403-228.000.

Hung, William M., to Hilton-Davis Chemical Co., The. 3-substituted carbonyloxy-7-disubstituted amino-10-substituted carbonylphenothiazines. 4,604,458, Cl. 544-37.000.

Hung, William M., to Hilton-Davis Chemical Co., The. 5-substituted-9-disubstituted amino-12-substituted carbonylbenzo[a]phenoxazines. 4,604,461, Cl. 544-99.000.

Hung, William M., to Hilton-Davis Chemical Co., The. 4-substituted amido-8-disubstituted aminoimidazophenoxazines. 4,604,462, Cl. 544-99.000.

Hunsberger, Dennis J.: *See—*
Brown, Sanford S.; Hunsberger, Dennis J.; and Lundberg, Michael R., 4,604,500, Cl. 179-18.0ES.

Huppee, Robert. Barbed tubing connector. 4,603,890, Cl. 285-239.000.

Hurlock, John R.: *See—*
Kneller, James F.; and Hurlock, John R., 4,604,211, Cl. 210-701.000.

Hutchison, Alan J., to Ciba-Geigy Corporation. Certain benzo-(pyrano and thiopyrano)-pyridines, useful as CNS agents. 4,604,397, Cl. 514-291.000.

Hutson, James H. Feed roll construction for log debarkers. 4,603,718, Cl. 144-208.00E.

Hwang, Juin-Jet; McKeighan, Ronald E.; and Jaeger, Paul M., to Advanced Technology Laboratories, Inc. Circuit for monitoring contact of ultrasound transducer with patient. 4,603,702, Cl. 128-660.000.

Hychalk, Leonard V.: *See—*
Chambers, Gary C.; and Hychalk, Leonard V., 4,603,752, Cl. 180-6.400.

Hydril Company: *See—*
Edwards, Jon L.; and Carter, Mark L., 4,603,740, Cl. 166-319.000.
Wong, Fred S.; and Grohman, Larry F., 4,603,742, Cl. 166-374.000.

Hydro Rene Leduc: *See—*
Porel, Louis C., 4,603,711, Cl. 138-30.000.

Hystad, Per H. Closeable restraint for maintaining a tow line between guide pins on a boat. 4,603,649, Cl. 114-199.000.

Hyun, Hyung-Hwan: *See—*
Zeikus, Joseph G.; and Hyun, Hyung-Hwan, 4,604,352, Cl. 435-42.000.

I-Flow Corporation: *See—*
Brown, Eric W.; and Tai, Henry T., 4,604,093, Cl. 604-248.000.

ICI Americas, Inc.: *See—*
Yellin, Tobias O.; Edwards, Philip N.; and Large, Michael S., 4,604,465, Cl. 544-326.000.

ICI Australia Limited: *See—*
Conway, Richard J.; Watson, Keith G.; and Farquharson, Graeme J., 4,604,132, Cl. 71-90.000.
Watson, Keith G.; Wishart, John D.; Farquharson, Graeme J.; Bird, Graham J.; and Cross, Lindsay E., 4,604,128, Cl. 71-88.000.

Ida, Mitsuru; and Shimada, Minoru, to Sony Corporation. Automatic mode-change mechanism for tape recorder. 4,604,662, Cl. 360-74.100.

Ide, Junya; Muramatsu, Shigeki; Tsujita, Yoshio; and Kuroda, Masao, to Sankyo Company Limited. Octahydronaphthalene derivatives and their preparation. 4,604,472, Cl. 549-292.000.

Idemitsu Kosan Company Limited: *See—*
Shimizu, Nobuaki; Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,604,492, Cl. 585-360.000.
Shimizu, Nobuaki; Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,604,493, Cl. 585-360.000.

Ieki, Mitsuru: *See—*
Yano, Nobuyuki; Inami, Takashi; Ieki, Mitsuru; and Wakai, Masao, 4,603,460, Cl. 29-157.30V.

Igarashi, Kohei; and Tomita, Kazuo, to Toyota Jidosha Kabushiki Kaisha. Apparatus for indicating an optimum time to shift a manual transmission installed in a vehicle. 4,604,700, Cl. 364-424.000.

Igashira, Toshihiko: *See—*
Yoshinaga, Toru; Igashira, Toshihiko; Sakakibara, Yasuyuki; and Natsuyama, Yukihiro, 4,603,671, Cl. 123-467.000.

IGC, Inc.: *See—*
Machart, Ronald C., Jr., 4,604,200, Cl. 210-314.000.

Igelfors Bruks AB: *See—*
Ekman, Uno; and Hjert, Leif, 4,603,839, Cl. 254-329.000.

Ihrman, Kryn G., to Ethyl Corporation. Monoalkylation of 1-alkyldiaminobenzenes. 4,604,484, Cl. 564-305.000.

IIda, Taketoshi, to Kabushiki Kaisha Toshiba. Delay line circuit arrangement and ultrasonic imaging apparatus utilizing the same. 4,603,586, Cl. 73-626.000.

Iijima, Hiromichi: *See—*
Okamoto, Miyoshi; Iijima, Hiromichi; and Miyoshi, Akito, 4,604,320, Cl. 428-290.000.

Iizuka, Haruhiko: *See—*
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,604,611, Cl. 340-576.000.

Ikada, Yoshito; Gen, Shokyu; Shimizu, Yasuhiko; Tamura, Koichi; Nakamura, Tatsuo; Kimura, Sosuke; Cho, Tsuneo; Tadokoro, Hideki; and Hori, Kazuaki, to Japan Medical Supply Co., Ltd. Use of molded polymeric material for preventing adhesion of vital tissues. 4,603,695, Cl. 128-334.00R.

Ikeda, Hideo: *See—*
Sugimoto, Tadao; Ikeda, Hideo; Mifune, Hiroyuki; and Nakamura, Koki, 4,604,339, Cl. 430-244.000.

Ikeda, Hironosuke; Yamashita, Etsuro; and Nakashima, Hitoshi, to Sanyo Electric Co., Ltd. Non-aqueous electrolyte battery with spiral wound electrodes. 4,604,333, Cl. 429-94.000.

Ikeda, Isao: *See—*
Okahara, Mitsuo; and Ikeda, Isao, 4,604,321, Cl. 428-319.900.

Ikemoto, Yutaka; and Sawada, Ken, to Sharp Kabushiki Kaisha. Electronic translator. 4,604,698, Cl. 364-419.000.

Ikezawa, Yuji: *See—*
Mitsuno, Tatsuyuki; Koyama, Teruhisa; and Ikezawa, Yuji, 4,604,421, Cl. 524-449.000.

Illers, Karl-Heinz: *See—*
Hambrecht, Juergen; Illers, Karl-Heinz; Echte, Adolf; and Swoboda, Johann, 4,604,415, Cl. 524-140.000.

Illinois Tool Works Inc.: *See—*
Frano, Francis G., 4,604,014, Cl. 411-338.000.
Tennerstedt, M. Richard, 4,604,009, Cl. 409-233.000.

Imai, Hirosuke: *See—*
Yuasa, Hitoshi; Matsuno, Mitsuo; and Imai, Hirosuke, 4,604,490, Cl. 585-21.000.

Imai, Toshihiro, to Olympus Optical Co., Ltd. Large-aperture wide-angle zoom lens system. 4,603,948, Cl. 350-426.000.

Imaizumi, Shiro: *See—*
Nishina, Masaaki; Imaizumi, Shiro; and Ozaki, Osamu, 4,604,454, Cl. 528-491.000.

Imanishi, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Numerical control machining method and system therefor. 4,604,705, Cl. 364-474.000.

Imhof, Ernst: *See—*
Grunwald, Werner; Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; and Schmid, Kurt, 4,603,667, Cl. 123-297.000.

Imperial Chemical Industries, Limited: *See—*
Yellin, Tobias O.; Edwards, Philip N.; and Large, Michael S., 4,604,465, Cl. 544-326.000.

Imperial Chemical Industries PLC: *See—*
Colquhoun, Howard M., 4,604,485, Cl. 568-319.000.
Smallwood, Peter V., 4,604,419, Cl. 524-318.000.

INA Walzlager Schaeffler KG: *See—*
Doppling, Horst; Hertrich, Steffen; Poschl, Walter; Ritter, Joachim; and Sill, Karl, 4,603,923, Cl. 384-7.000.

Inagaki, Syoji; Sanpe, Hideyuki; and Makihara, Norimitsu, to Toyoda Koki Kabushiki Kaisha. Numerical control machine tool with an emergency origin returning function. 4,604,560, Cl. 318-567.000.

Inami, Tai: *See—*
Mitsuda, Yoshinobu; Inami, Tai; and Mori, Koji, 4,603,994, Cl. 401-209.000.

Inami, Takashi: *See—*
Yano, Nobuyuki; Inami, Takashi; Ieki, Mitsuru; and Wakai, Masao, 4,603,460, Cl. 29-157.30V.

Inamoto, Yoshiaki: *See—*
Fujikura, Yoshiaki; Kajihara, Yasushi; Takaishi, Naotake; Inamoto, Yoshiaki; Kimura, Akio; Nakajima, Motoki; and Miyamoto, Norioki, 4,604,488, Cl. 568-820.000.

Inco Alloys International, Inc.: *See—*
Mehltretter, James C.; Woodard, Winfred L., III; Orlando, John J.; and Goodrich, Charles B., 4,603,814, Cl. 241-30.000.

Industrial Air, Inc.: *See—*
Cotton, Worth B., Jr., 4,604,108, Cl. 55-20.000.

Industrie Tessili Bresciane S.P.A.: *See—*
Bertotto, Serafino, 4,604,310, Cl. 428-36.000.

Inohara, Kazumi: *See—*
Sakata, Isao; Nakajima, Susumu; Koshimizu, Koichi; Samejima, Natsuki; Inohara, Kazumi; and Takata, Hiroyuki, 4,604,241, Cl. 540-145.000.

Inoue, Mamoru: *See—*
Manabe, Seiichi; Iwata, Michitaka; and Inoue, Mamoru, 4,604,326, Cl. 428-398.000.

Inoue, Nobuhisa: *See—*
Yamashita, Tsukasa; Inoue, Nobuhisa; Mori, Kazuhiko; and Matano, Masaharu, 4,604,707, Cl. 364-822.000.

Inoue, Yoshihisa: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,604,385, Cl. 514-183.000.

Insta-Foam Products, Inc.: *See—*
Luegering, Gregory J., 4,603,813, Cl. 239-399.000.

Institut National de la Recherche Scientifique: *See—*
Jean, Benoit; Bergevin, Benoit; and Rheault, Fernand, 4,603,685, Cl. 126-433.000.

Integrated Sciences, Inc.: *See—*
Fisher, Carl, Jr.; Carrington, Charles R.; and Grant, George A., 4,604,706, Cl. 364-507.000.

Intermec Corporation: *See—*
Wiklof, Christopher A.; Apperson, Gerald R.; Brooks, Robert J.; and Samuel, Robert A., 4,604,635, Cl. 346-226.000.

International Business Machines Corporation: *See—*
Aichelmann, Frederick J., Jr.; and Ryan, Philip M., 4,604,751, Cl. 371-38.000.
Amezcua, Robert; Clements, Silous F.; Coenen, John S.; DaFoe, Ralph H.; Day, Michael N.; Ross, Dennis M.; and Simpson, Richard O., 4,604,710, Cl. 364-900.000.
Beckham, Keith F.; Kolman, Anne E.; McGuire, Kathleen M.; Puttlitz, Karl J.; and Quinones, Horatio, 4,604,644, Cl. 357-80.000.

Blount, Frederick T.; Capowski, Robert S.; Casper, Daniel F.; DelSonno, Lawrence R.; Geller, Robert F.; Kusmiss, Joseph M.; and Zimmerman, Terrence K., 4,604,709, Cl. 364-900.000.
Blum, Arnold, 4,604,746, Cl. 371-25.000.
Cohen, Donald K., 4,604,739, Cl. 369-45.000.
Crabtree, Robert P.; and Kelly, Keith F., Jr., 4,604,690, Cl. 364-200.000.
Farr, Robert W. E.; and Judd, Ian D., 4,604,614, Cl. 340-728.000.
Gersbach, John E.; and Moser, John J., 4,604,531, Cl. 307-445.000.
Godard, Dominique; and Morlec, Emile, 4,604,713, Cl. 364-484.000.
Helinski, Edward F.; and Lee, Ho C., 4,603,985, Cl. 400-167.000.
Hough, Roger E., 4,604,694, Cl. 364-200.000.
Murray, Jack T., 4,604,755, Cl. 375-98.000.
Pohl, Wolfgang D., 4,604,520, Cl. 250-216.000.
Pricer, Wilbur D., 4,604,534, Cl. 307-530.000.

International Flavors & Fragrances Inc.: *See*—
Wiegers, Wilhelmus J.; and Vock, Manfred H., 4,604,232, Cl. 252-522.00R.
Wiegers, Wilhelmus J.; and Sprecker, Mark A., 4,604,487, Cl. 568-715.000.

International Harvester Company: *See*—
Mann, Joseph M., 4,604,604, Cl. 340-52.00A.

International Standard Electric Corporation: *See*—
Adams, Graham L., 4,603,972, Cl. 356-4.000.

Interspec, Inc.: *See*—
Luthra, Ajay K.; Kassam, Saleem; and Bernardi, Richard B., 4,604,697, Cl. 364-414.000.

Investronica, S.A.: *See*—
Martinez Llaneza, Manuel, 4,603,630, Cl. 101-227.000.

Ipco Corporation: *See*—
Weissman, Bernard, 4,604,060, Cl. 433-221.000.

Irvin, Howard B.; Stahl, G. Allan; and Clark, Earl, to Phillips Petroleum Company. Drilling fluids. 4,604,216, Cl. 252-8.510.

Irving, Edward; and Smith, Terence J., to Ciba-Geigy Corporation. Process for the production of images using sequentially liquid polymerizing compositions and photocuring. 4,604,344, Cl. 430-325.000.

Irwin Measuring Tool Co.: *See*—
Cohen, Howard; and Dauer, Alois, 4,603,481, Cl. 33-138.000.

Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., to Excello Specialty Company, The. Method of manufacturing water deflector for vehicle doors. 4,604,302, Cl. 427-208.600.

Ishibane, Kyuhei: *See*—
Suefuji, Kazutaka; Yasuda, Hiromu; Hayashi, Masakatsu; Arata, Tetsuya; Oguni, Kensaku; Kuroda, Shigeaki; Atsumi, Akira; Ishibane, Kyuhei; Terada, Hirokiyo; Senshu, Takao; and Kogure, Hiroshi, 4,603,556, Cl. 62-180.000.

Ishibashi, Yoji; Sato, Isao; Kato, Fumio; Ohmori, Takashi; and Hayashi, Noriyuki, to Hitachi, Ltd. Method of supplying fuel into gas turbine combustor. 4,603,548, Cl. 60-39.060.

Ishida, Masayuki: *See*—
Onishi, Ken; Ishida, Masayuki; Shirozu, Masakazu; Takedomi, Toshikatsu; Namekawa, Makoto; and Haikawa, Yukihiko, 4,604,747, Cl. 371-37.000.

Ishihara, Shosaku; Kuroki, Takashi; Toda, Gyozo; Yasukawa, Akio; and Sakamoto, Tatsuji, to Hitachi, Ltd. Ceramic multilayer wiring board. 4,604,496, Cl. 174-68.500.

Ishihara, Takeo: *See*—
Matsutoh, Takushi; Wakatsuki, Goroei; Kitamura, Yoshitaka; and Ishihara, Takeo, 4,603,754, Cl. 180-221.000.

Ishii, Yoichi: *See*—
Sarumaru, Kohei; Shibano, Takeshi; Ishii, Yoichi; and Yamamoto, Etsuji, 4,604,370, Cl. 502-38.000.

Ishikawa, Katsuhiko: *See*—
Aota, Koichi; Ishikawa, Katsuhiko; and Yokoi, Naoki, 4,603,970, Cl. 355-133.000.

Ishima, Kazumi: *See*—
Jinnai, Koichiro; Fukazawa, Takao; Ito, Tadashi; Koike, Takahisa; Murai, Toshiharu; and Ishima, Kazumi, 4,604,631, Cl. 346-1.100.

Isowa, Eiichi: *See*—
Mori, Kazuo; and Isowa, Eiichi, 4,603,654, Cl. 118-202.000.

Isowa Industry Company, Ltd.: *See*—
Mori, Kazuo; and Isowa, Eiichi, 4,603,654, Cl. 118-202.000.

Itano, Kiyoshi: *See*—
Yoshida, Masanobu; and Itano, Kiyoshi, 4,604,730, Cl. 365-200.000.

Ito, Akio: *See*—
Konomi, Toshiaki; Ito, Koji; Nagahori, Yukihiro; and Ito, Akio, 4,604,544, Cl. 310-338.000.

Ito, Hiroshi: *See*—
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,603,596, Cl. 74-336.00R.

Ito, Katsumi: *See*—
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, 4,603,753, Cl. 180-131.000.

Ito, Koji: *See*—
Konomi, Toshiaki; Ito, Koji; Nagahori, Yukihiro; and Ito, Akio, 4,604,544, Cl. 310-338.000.

Ito, Mitsuru, to Tokai Electric Wire Company Limited; and Sumitomo Electric Industries Ltd. Interconnection apparatus for wiring harnesses. 4,603,930, Cl. 339-17.00R.

Ito, Tadashi: *See*—
Jinnai, Koichiro; Fukazawa, Takao; Ito, Tadashi; Koike, Takahisa; Murai, Toshiharu; and Ishima, Kazumi, 4,604,631, Cl. 346-1.100.

Itoh, Shigeyuki; Watatani, Yoshizumi; and Mohri, Katsuo, to Hitachi, Ltd. Apparatus for detecting a drop-out in a magnetic recording/reproducing apparatus. 4,604,659, Cl. 360-38.100.

Iwamoto, Taro: *See*—
Kamajima, Kohji; Nakano, Yoshiyuki; Fujie, Masakatsu; Hosoda, Yuji; Iwamoto, Taro; and Honma, Kazuo, 4,604,561, Cl. 318-567.000.

Iwasa, Tadanobu, to Toyoda Gosei Co., Ltd. Weather strip. 4,603,899, Cl. 296-154.000.

Iwata, Michitaka: *See*—
Manabe, Seiichi; Iwata, Michitaka; and Inoue, Mamoru, 4,604,326, Cl. 428-398.000.

J. I. Case Company: *See*—
Cornell, Charles R., 4,603,543, Cl. 56-10.200.

J. T. Baker Chemical Company: *See*—
Flashner, Michael, 4,604,235, Cl. 530-387.000.

Jackson, James M.: *See*—
Smith, Ronald A.; Jackson, James M.; Lehfeldt, Carl L.; Cygnarowicz, Leonard P.; Moshfegh, Khosro; Blanchard, Kenneth L.; and Nelson, Kenneth J., 4,603,567, Cl. 72-8.000.

Jackson, Melvin R.: *See*—
Siemers, Paul A.; Jackson, Melvin R.; and Rutkowski, Stephen F., 4,603,568, Cl. 72-47.000.

Jackson, Robert V., to McCulloch Corporation. Magnetic structure for use in a chain saw or edge trimmer ignition system or the like. 4,603,664, Cl. 123-149.00D.

Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Process for preparing poly(ester-amides). 4,604,449, Cl. 528-288.000.

Jacobs, Erwin P.: *See*—
Schwabe, Ulrich; Jacobs, Erwin P.; and Neppl, Franz, 4,603,472, Cl. 29-576.00B.

Jacoby, Charles E., to SI Handling Systems Inc. Drive wheel for driverless vehicle. 4,603,720, Cl. 152-209.00R.

Jacquart, Alain: *See*—
Vilotte, Alain; and Jacquart, Alain, 4,603,809, Cl. 229-2.5EC.

Jaeger, Paul M.: *See*—
Hwang, Juin-Jet; McKeighan, Ronald E.; and Jaeger, Paul M., 4,603,702, Cl. 128-660.000.

Jagen, Paul R., to Du Pont de Nemours, E. I., and Company. Electrical connector for a shielded cable. 4,603,936, Cl. 339-143.00R.

Jager, Horst, to Bayer Aktiengesellschaft. Triphendioxazine reactive dyestuffs. 4,604,459, Cl. 544-76.000.

Jakubowski, John A., to Calgon Corporation. Admixtures of 2-bromo-2-bromomethylglutaronitrile and 2,2-dibromo-3-nitrilopropionamide. 4,604,405, Cl. 514-526.000.

Jandrasits, Walter G.: *See*—
Wolbert, Ronald R.; and Jandrasits, Walter G., 4,603,463, Cl. 29-402.070.

Janik, Gloria: *See*—
Cole, Richard L.; and Janik, Gloria, 4,604,424, Cl. 524-862.000.

Janome Sewing Machine Co., Ltd.: *See*—
Takenoya, Hideaki; and Mishima, Fumiyuki, 4,603,988, Cl. 400-649.000.

Janssen, Alex P., Jr.; and Janssen, Alexander P. Hinge forming and attaching apparatus. 4,603,454, Cl. 29-11.000.

Janssen, Alexander P.: *See*—
Janssen, Alex P., Jr.; and Janssen, Alexander P., 4,603,454, Cl. 29-11.000.

Japan Exlan Company Limited: *See*—
Fujimatsu, Masaaki; and Kobashi, Toshiyuki, 4,604,428, Cl. 525-276.000.

Japan Medical Supply Co., Ltd.: *See*—
Ikada, Yoshito; Gen, Shokyu; Shimizu, Yasuhiko; Tamura, Koichi; Nakamura, Tatsuo; Kimura, Sosuke; Cho, Tsuneo; Tadokoro, Hideki; and Hori, Kazuaki, 4,603,695, Cl. 128-334.00R.

Japan Synthetic Rubber Co., Ltd.: *See*—
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, 4,603,722, Cl. 152-209.00R.

Jaye, Frederick O., Jr. Galvanizing apparatus. 4,603,656, Cl. 118-429.000.

JCC Construction Company AB: *See*—
Laneus, Per, 4,603,910, Cl. 299-13.000.

Jean, Benoit; Bergevin, Benoit; and Rheault, Fernand, to Institut National de la Recherche Scientifique. Solar heating system. 4,603,685, Cl. 126-433.000.

Jean Walterscheid GmbH: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Franz-Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,603,998, Cl. 403-322.000.

Jeco Co., Ltd.: *See*—
Konomi, Toshiaki; Ito, Koji; Nagahori, Yukihiro; and Ito, Akio, 4,604,544, Cl. 310-338.000.

Jenni, Karl, to Aktiengesellschaft Adolph Saurer. Embroidery machine framework. 4,603,646, Cl. 112-90.000.

Jenoptik Jena G.m.b.H.: *See*—
Zeth, Ulrich; Klose, Heinrich; Voss, Gunther; and Winkler, Peter, 4,603,960, Cl. 354-432.000.

Jensen, Earl M.: *See*—
Toro Lira, Guillermo L.; and Jensen, Earl M., 4,604,020, Cl. 414-217.000.

Jensen, Edward G.: *See*—
Borcherdt, Roger D.; Fletcher, Jon P.; Warrick, Richard E.; Maxwell, Gary L.; Jensen, Edward G.; and Schaack, John V., 4,604,699, Cl. 364-420.000.

Jeschke, Willi; and Spiegel, Nikolaus, to Heidelberger Druckmaschinen AG. Device for register-maintaining alignment of a flexible printing

plate of a plate cylinder of rotary printing machine. 4,603,641, Cl. 101-415.100.
Jinnai, Koichiro; Fukazawa, Takao; Ito, Tadashi; Koike, Takahisa; Murai, Toshiharu; and Ishima, Kazumi, to Ricoh Company, Ltd. Control system and method for charge control ink jet printer. 4,604,631, Cl. 346-1.100.
Joh, Yasushi; Nagase, Toshio; and Kaneko, Noriaki, to Nippon Zeon Co., Ltd. Stable polymer emulsion composition capable of giving a thromboresistant surface, and process for production thereof. 4,604,412, Cl. 523-112.000.
John Wyeth & Brother Limited: *See—*
Ward, Terence J., 4,604,398, Cl. 514-294.000.
John Zink Company: *See—*
Schwartz, Robert E.; and Noble, Roger K., 4,604,048, Cl. 431-8.000.
Johns Hopkins University, The: *See—*
Seamone, Woodrow; and Loveless, John H., 4,604,098, Cl. 623-60.000.
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Weinberg, Melvin S.; Cormier, Alan D.; and Jones, Ronald L., 4,604,166, Cl. 204-1.00T.
Jones, Wallace R.: *See—*
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Farr, Robert W. E.; and Judd, Ian D., 4,604,614, Cl. 340-728.000.
Juen, Donnie R., to Dow Corning Corporation. Method for silalactone preparation and use. 4,604,478, Cl. 556-439.000.
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Kabushiki Kaisha Kobe Seiko Sho: *See—*
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Ilda, Taketoshi, 4,603,586, Cl. 73-626.000.
Koike, Noboru; Kitamura, Hidenari; and Tomita, Tsuneo, 4,603,829, Cl. 248-553.000.
Machida, Kaoru, 4,603,589, Cl. 73-861.280.
Matsuda, Hideo, 4,604,638, Cl. 357-23.400.
Sakurai, Toshiharu, 4,604,642, Cl. 357-70.000.
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Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; Sugino, Eiichi; and Mutai, Masahiko, 4,604,463, Cl. 544-125.000.
Sawada, Haruji; and Watanuki, Masaaki, 4,604,353, Cl. 435-58.000.
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Kajihara, Yasushi: *See—*
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Kajiyama, Katsuyoshi: *See—*
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Kam, Sheung-tsam; Erhardt, Paul W.; Borgman, Robert J.; and O'Donnell, John P., to American Hospital Supply Corporation. Compounds for treatment or prophylaxis of cardiac disorders. 4,604,481, Cl. 560-39.000.
Kamajima, Kohji; Nakano, Yoshiyuki; Fujie, Masakatsu; Hosoda, Yuji; Iwamoto, Taro; and Honma, Kazuo, to Hitachi, Ltd. Control apparatus for multi-jointed arm mechanism. 4,604,561, Cl. 318-567.000.
Kamerling, William. System for preventing or treating open angle glaucoma and presbyopia. 4,603,697, Cl. 128-421.000.
Kamiyama, Yasuo: *See—*
Shiga, Shoji; Hayakawa, Takayuki; and Kamiyama, Yasuo, 4,604,169, Cl. 204-34.000.
Kamohara, Hiroshi; Hayashi, Shohei; and Ohi, Nobukazu, to G-C Dental Industrial Corp. Investments for dental casting. 4,604,142, Cl. 106-38.510.
Kan, Phillip T.: *See—*
Chang, Yu-Wen; Kan, Phillip T.; and Ross, Oakley G., 4,603,942, Cl. 350-96.240.
Kanabara, Susumu; and Aihara, Kenji, to Sumitomo Metal Industries, Ltd. Process for production of steel bar or steel wire having an improved spheroidal structure of cementite. 4,604,145, Cl. 148-12.00B.
Kanechiku, Minoru: *See—*
Murakami, Kanji; Akahoshi, Haruo; Kawamoto, Mineo; Wajima, Motoyo; Matsuda, Yoichi; Kawakubo, Kyoji; Kanechiku, Minoru; Yoshimura, Toyofusa; and Matsunaga, Makoto, 4,604,160, Cl. 156-630.000.
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Kaneko, Shinichi, to Marcon Electronics Co., Ltd. Method of manufacturing chip-type aluminum electrolytic capacitor. 4,603,467, Cl. 29-570.000.
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Kaplan, Albert, to RCA Corporation. Method and apparatus for measuring the time delay between signals. 4,604,717, Cl. 364-569.000.
Karaki, Nobuo, to Seiko Epson Corporation. Intensity modulation circuit for cathode-ray tubes. 4,604,555, Cl. 315-383.000.
Karanewsky, Donald S.: *See—*
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Karlock, James A. Video processing circuit. 4,604,646, Cl. 358-28.000.
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Kataoka, Hiroyuki: *See—*
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Kato, Fumio: *See*—
Ishibashi, Yoji; Sato, Isao; Kato, Fumio; Ohmori, Takashi; and Hayashi, Noriyuki, 4,603,548, Cl. 60-39.060.
Kato, Kanji; Higashino, Junichi; and Naruse, Akisuke, to Hitachi, Ltd. Method and apparatus for controlling a robot. 4,604,716, Cl. 364-513.000.
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Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Futagami, Mikio, to Sumitomo Chemical Company, Limited. Anti-static acrylic resin composition and method for the production thereof. 4,604,414, Cl. 524-139.000.
Kato, Yukio: *See*—
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Katz, Edward; Benedicktus, Jon J.; Knarr, Edward L.; and Scallet, Barrett L., to Busch Industrial Products Corporation. Immobilized glucose isomerase containing microbial cells. 4,604,354, Cl. 435-94.000.
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Breitscheidel, Hans-Ulrich; and Kautz, Rudolf, 4,603,852, Cl. 272-109.000.
Kavoussi, James P. Aerosol shaving brush. 4,603,992, Cl. 401-190.000.
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Kawajiri, Seizo, to Daigo Nutritive Chemicals, Ltd. Infusion solution for parenteral nutrition. 4,604,286, Cl. 424-149.000.
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Kawamoto, Hiroshi: *See*—
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, 4,604,749, Cl. 371-38.000.
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Murakami, Kanji; Akahoshi, Haruo; Kawamoto, Mineo; Wajima, Motoyo; Matsuda, Yoichi; Kawakubo, Kyoji; Kanechiku, Minoru; Yoshimura, Toyofusa; and Matsunaga, Makoto, 4,604,160, Cl. 156-630.000.
Kawamura, Hideaki: *See*—
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Kawasaki, Hisamitsu; and Kato, Yukio, to Toyoda Koki Kabushiki Kaisha. Tool clamping device for a spindle head. 4,604,012, Cl. 409-233.000.
Kay, Alan R.; and Wilson, William G. Methods of desulfurizing gases. 4,604,268, Cl. 423-230.000.
Kay, Edward L.; and Roskos, Kenneth B., to Firestone Tire & Rubber Co., The. Polyurethane prepolymer comprising the reaction product of at least two active hydrogen containing substances with polyisocyanate. 4,604,445, Cl. 528-64.000.
Kayser, Eleonore G., to United States of America, Navy. Recrystallization of hexanitrostilbene from dimethylsulfoxide and methanol. 4,604,489, Cl. 568-931.000.
Kazuo, Ozawa; and Saburo, Yoinara, to Balibali System Co., Ltd. Gas cooking device. 4,603,684, Cl. 126-299.00R.
Kearney & Trecker Corporation: *See*—
Ostby, Lyle D., 4,603,485, Cl. 33-367.000.
Keller Holding AG: *See*—
Walt, Hans; and Sutterlin, Dieter, 4,604,255, Cl. 264-273.000.
Keller, R. W. Fuel vaporizer for internal combustion engine. 4,603,672, Cl. 123-545.000.
Keller, Rene , to Emhart Industries, Inc. Method of sensing gobs of molten glass. 4,604,122, Cl. 65-29.000.
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Sibley, Richard D.; and Keller, William F., 4,603,591, Cl. 74-2.000.
Kelley, Stephen H., to Motorola, Inc. Switched capacitor precision difference amplifier. 4,604,584, Cl. 330-9.000.
Kelly, Keith F., Jr.: *See*—
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Kendall Company, The: *See*—
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Kennametal Inc.: *See*—
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Keys, Steven F.; and Peppler, Dennis L., to Essex Group, Inc. Method for applying high solids enamels to magnet wire. 4,604,300, Cl. 427-120.000.
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Kido, Yoshinobu, to Toyo Kogyo Co., Ltd. Safety device for turbocharged engine. 4,603,552, Cl. 60-605.000.
Kijima, Takao; and Maebayashi, Jiro, to Mazda Motor Corporation. Vehicle rear suspension mechanism. 4,603,882, Cl. 280-701.000.
Kikkawa, Ikuo: *See*—
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Kim, Tai K.: *See*—
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Kimball, David V.; and Frost, Charles W., to Kimball Industries, Inc. High productivity vibration test fixture suited for testing printed circuit boards. 4,603,587, Cl. 73-663.000.
Kimball Industries, Inc.: *See*—
Kimball, David V.; and Frost, Charles W., 4,603,587, Cl. 73-663.000.
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McFarland, Timothy M.; and Lang, Theodore B., 4,604,313, Cl. 428-172.000.
Kimoto, Masayoshi, to Fujitsu Limited. Static-type semiconductor memory device. 4,604,729, Cl. 365-190.000.
Kimura, Akio: *See*—
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Kin, Lai: *See*—
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King, Patrick D., to Flo-Con Systems, Inc. Method of sliding gate valve operation. 4,603,842, Cl. 266-44.000.
Kinjo, Hisao, to Victor Company of Japan, Ltd. Recording medium for recording and/or reproducing apparatus. 4,604,667, Cl. 360-100.000.
Kinoshita, Hiroyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,604,639, Cl. 357-23.600.
Kinoshita, Takashi: *See*—
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Kirschler, Howard A.: *See*—
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Kishimura, Masaaki: *See*—
Nakai, Yoshio; Yamauchi, Katsusuke; Kishimura, Masaaki; and Tateyama, Masamitsu, 4,604,416, Cl. 524-145.000.
Kissling, Bruno; and Robinson, Tibor, to Sandoz Ltd. After treatment of anionic dyeings, printings and optical brightenings on textil fibers. 4,604,101, Cl. 8-551.000.
Kitada, Akira; Yamazaki, Kikuo; and Yamazaki, Hisashi, to Fuji Photo Film Co., Ltd. Radiation image storage panel with dispersing agent. 4,604,525, Cl. 250-363.00R.

Kitagawa, Junji: *See—*
Yamanoue, Kouichi; Kitagawa, Junji; Akita, Shigeyuki; and Kuno, Akira, 4,603,581, Cl. 73-304.00C.

Kitahara, Takahiro: *See—*
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Kitahara, Toshihiro; and Noda, Yasushi, to Teac Corporation. Data transfer apparatus for use with a magnetic disk cartridge. 4,604,666, Cl. 360-99.000.

Kitamura, Hidenari: *See—*
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Kitamura, Yoshitaka: *See—*
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Kitsukawa, Tomohiko; Kusano, Hiroshi; Miyata, Eiji; and Sugawara, Toyokazu, to Mitsubishi Chemical Industries Limited. Method separating phenylalanine and cinnamic acid. 4,604,483, Cl. 562-443.000.

Kitterman, B. Layton: *See—*
Chen, Gilbert; Kitterman, B. Layton; Glaspie, Donald L.; and Axe, John R., 4,604,247, Cl. 261-94.000.

Klaus, Irving; Herbstman, Warren; and Lopez, Jairo, to Excelco International, Inc. Dental compositions, fired dental porcelains and processes for making and using same. 4,604,059, Cl. 433-217.100.

Kleeberg, Wolfgang: *See—*
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Klein, Joseph T.: *See—*
Davis, Larry; and Klein, Joseph T., 4,604,395, Cl. 514-255.000.

Kleinhany, Arno; and Gutmann, Walter, to Bauer Kaba AG. Lock cylinder with integrated electromagnetic locking system. 4,603,564, Cl. 70-277.000.

Kley, Victor B. Electronic viewing system for integrated circuit packages. 4,604,648, Cl. 358-101.000.

Klimeck, Edward F.: *See—*
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Klinkowski, Peter R.: *See—*
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Kljuchnikov, Valery F.: *See—*
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Klose, Heinrich: *See—*
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Knapp, Kenneth M. Unitized pig body for parafin removal. 4,603,449, Cl. 15-104.06R.

Knappe, Wolfgang-Reinhold: *See—*
Rothe, Anselm; Knappe, Wolfgang-Reinhold; and Trasch, Heinz-Friedrich, 4,604,264, Cl. 422-56.000.

Knarr, Edward L.: *See—*
Katz, Edward; Benedicktus, Jon J.; Knarr, Edward L.; and Scallet, Barrett L., 4,604,354, Cl. 435-94.000.

Kneller, James F.; and Hurlock, John R., to Nalco Chemical Company. Acrylic acid-sodium vinylsulfonate-vinyl acetate terpolymer and use thereof as a dispersant. 4,604,211, Cl. 210-701.000.

Knickerbocker, Robert H., to Siemon Company, The. Multiple electrical connector block with improved wire wrap pins. 4,603,935, Cl. 339-97.00P.

Knies, Heinz: *See—*
Schneider, Dieter; Knies, Heinz; and Kaudela, Gerhard, 4,604,100, Cl. 8-526.000.

Knight, Douglas W. Headrail for a window blind. 4,603,725, Cl. 160-243.000.

Knight, Robert G.: *See—*
Hindmarsh, Leslie W.; Knight, Robert G.; and Sanders, Gerald J., 4,603,911, Cl. 299-91.000.

Knight, Rodney A.: *See—*
Chu, Chaokang; Fiore, Joseph V.; Knight, Rodney A.; Marinaccio, Paul J.; and Roy, Asit, 4,604,208, Cl. 210-636.000.

Knipple, Raymond P.: *See—*
Thorpe, Donald H.; and Knipple, Raymond P., 4,604,436, Cl. 525-504.000.

Knoer, Peter: *See—*
Aquino, Dolores C.; DaPrato, Philip L.; Gouker, Toby R.; and Knoer, Peter, 4,604,105, Cl. 48-197.00R.

Knoll, Helmut: *See—*
Miller, Luitpold; Knoll, Helmut; and Meins, Juergen, 4,603,640, Cl. 104-282.000.

Knoll, Johann: *See—*
Rungger, Helmut; Fuchs, Erwin; and Knoll, Johann, 4,604,011, Cl. 409-138.000.

Knop, Charles M.: *See—*
Saad, Saad S.; and Knop, Charles M., 4,604,627, Cl. 343-786.000.

Knowles, William R.; and Cruttwell, Ian A., to Cambridge Instruments Limited. Scannable-beam microscopes and image stores therefor. 4,604,523, Cl. 250-310.000.

Knowlton, Gregory D.; and Pietz, John F., to Talley Defense Systems, Inc. Method and compositions for generating nitrogen gas. 4,604,151, Cl. 149-35.000.

Knudsen, Chris: *See—*
Benn, George; Frost, Wendell; Knudsen, Chris; and Nieuwsma, David, 4,604,711, Cl. 364-900.000.

Kobari, Harukuni: *See—*
Hibino, Chitoshi; and Kobari, Harukuni, 4,604,658, Cl. 360-36.200.

Kobashi, Toshiyuki: *See—*
Fujimatsu, Masaaki; and Kobashi, Toshiyuki, 4,604,428, Cl. 525-276.000.

Kobayashi, Taishi: *See—*
Takamizawa, Minoru; Kobayashi, Taishi; Hayashida, Akira; and Takeda, Yoshihumi, 4,604,367, Cl. 501-95.000.

Kobayashi, Waichi: *See—*
Suzukawa, Yuichi; Kobayashi, Waichi; and Ohtaka, Satoshi, 4,604,143, Cl. 106-89.000.

Kobayashi, Yutaka; Fukami, Akira; and Suzuki, Takaya, to Hitachi, Ltd. Method of forming a large number of monocrystalline semiconductor regions on the surface of an insulator. 4,604,159, Cl. 156-617.00R.

Kobinger, Walter: *See—*
Reiffen, Manfred; Noll, Klaus; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,604,389, Cl. 514-213.000.

Koch, Franz-Heinz: *See—*
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Franz-Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,603,998, Cl. 403-322.000.

Koch, Klaus D.; Brunssen, Johann; and Sieling, Helmut, to HAG GF Aktiengesellschaft. Insert container for freeze-drying plants. 4,603,492, Cl. 34-237.000.

Koch, Ronald J.: *See—*
Gruber, Robert J.; Yourd, Raymond A., III; and Koch, Ronald J., 4,604,338, Cl. 430-106.000.

Kochie, Patrick S.: *See—*
Richmond, Moscow K.; Richmond, Thomas R.; and Kochie, Patrick S., 4,604,501, Cl. 179-81.00B.

Kodaira, Takanori: *See—*
Egawa, Akira; and Kodaira, Takanori, 4,603,954, Cl. 354-137.000.

Koehler, Gerard, to La Telemecanique Electrique. Electromagnet comprised of yokes and an armature supporting a permanent magnet fitted on its pole faces with pole pieces that project from the axis of the magnet, this axis being perpendicular to the direction of movement. 4,604,599, Cl. 335-230.000.

Koenig & Bauer Aktiengesellschaft: *See—*
Schneider, Georg, 4,603,632, Cl. 101-364.000.

Kogure, Hiroshi: *See—*
Suefuji, Kazutaka; Yasuda, Hiromu; Hayashi, Masakatsu; Arata, Tetsuya; Oguni, Kensaku; Kuroda, Shigeaki; Atsumi, Akira; Ishibane, Kyuhei; Terada, Hirokiyo; Senshu, Takao; and Kogure, Hiroshi, 4,603,556, Cl. 62-180.000.

Kogure, Tomohiko; Hanada, Ryoji; and Kabe, Kazuyuki, to Yokohama Rubber Co., Ltd., The. Base-cap tire tread. 4,603,721, Cl. 152-209.00R.

Kohnen, Klaus: *See—*
Niermann, Hans; Kohnen, Klaus; and Jorde, Joachim, 4,603,588, Cl. 73-794.000.

Kohno, Teruhisa, to Sumitomo Electric Industries, Ltd. Hydraulic pressure control valve for dual brake circuit. 4,603,917, Cl. 303-6.00C.

Koike, Noboru; Kitamura, Hidenari; and Tomita, Tsuneo, to Kabushiki Kaisha Toshiba. System for fixedly mounting a case or the like box-shaped article. 4,603,829, Cl. 248-553.000.

Koike, Osamu: *See—*
Fujii, Yoshimasa; Mitsuhashi, Yoshinobu; and Koike, Osamu, 4,603,941, Cl. 350-96.150.

Koike, Takahisa: *See—*
Jinnai, Koichiro; Fukazawa, Takao; Ito, Tadashi; Koike, Takahisa; Murai, Toshiharu; and Ishima, Kazumi, 4,604,631, Cl. 346-1.100.

Koizumi, Hideharu: *See—*
Hiroyasu, Minoru; Hashimoto, Hitoshi; Yamada, Susumu; Miyanaka, Masaki; and Koizumi, Hideharu, 4,603,456, Cl. 29-33.00P.

Kojima, Chiaki; Hasegawa, Kayoko; and Miyahara, Kousuke, to Sony Corporation. Method of producing inline hologram lens. 4,603,938, Cl. 350-3.720.

Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See—*
Mochida, Haruo; Shimizu, Keiichi; and Okuya, Shigetami, 4,603,563, Cl. 70-276.000.

Kolhi, Martti: *See—*
Bergkvist, Bruno; Kolhi, Martti; Strandell, Erik; and Svemar, Christer, 4,604,136, Cl. 75-24.000.

Kollmorgen Technologies Corporation: *See—*
De Luca, Michael A.; and McCormack, John F., 4,604,299, Cl. 427-98.000.

Kolman, Anne E.: *See—*
Beckham, Keith F.; Kolman, Anne E.; McGuire, Kathleen M.; Puttlitz, Karl J.; and Quinones, Horatio, 4,604,644, Cl. 357-80.000.

Kolner, Brian H.: *See—*
Shaw, Herbert J.; Digonnet, Michel J. F.; Bergh, Ralph A.; Sorin, Wayne V.; and Kolner, Brian H., 4,603,940, Cl. 350-96.150.

Komaroff, Iwan: *See—*
Grunwald, Werner; Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; and Schmid, Kurt, 4,603,667, Cl. 123-297.000.

Komatsu, Isamu; and Serizawa, Kenkichi, to Aida Engineering Limited. Grinding robot. 4,603,511, Cl. 51-165.710.

Konchan, Jeffrey L.: *See—*
Espinoza, John A.; Konchan, Jeffrey L.; and Rimbey, Ronald P., 4,603,877, Cl. 280-807.000.

Kondo, Hideya: *See—*
Yokoyama, Yoichi; and Kondo, Hideya, 4,604,596, Cl. 335-14.000.

Kondo, Susumu: *See—*
Takakura, Makoto; Kondo, Susumu; and Nogami, Tatsuya, 4,604,303, Cl. 427-229.000.

Kondo, Takumi, to Nissan Motor Co., Ltd. Joining jig for vehicle body panels. 4,603,462, Cl. 29-281.100.

Konishi, Katsuzi: *See—*
Sakurai, Kiyomi; and Konishi, Katsuzi, 4,604,343, Cl. 430-281.000.

Konishi, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device and method for manufacturing the same. 4,604,641, Cl. 357-59.000.

Konishi, Satoshi, to Shibaura Denki Kabushiki Kaisha. Output circuit for a semiconductor memory device. 4,604,731, Cl. 365-203.000.

Konishi, Yoshimune: *See—*
Takemoto, Eiji; Miyaki, Masahiko; Norimatsu, Hideaki; Hobo, Nobuhito; Tsuzuki, Yoshihiko; and Konishi, Yoshimune, 4,603,669, Cl. 123-357.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Horiuchi, Tatumi, 4,603,850, Cl. 271-288.000.

Konishiroku Photo Industry Co., Ltd: *See—*
Kimura, Yoshiaki; and Tanaka, Yasuhiko, 4,604,633, Cl. 346-140.00R.

Konomi, Toshiaki; Ito, Koji; Nagahori, Yukihiro; and Ito, Akio, to Jeco Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Piezoelectric pressure indicator. 4,604,544, Cl. 310-338.000.

Kopp, Georg, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for making packaging bags. 4,603,540, Cl. 53-546.000.

Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muaceic, Gojko, to Boehringer Ingelheim International GmbH. Intermediate 1-alkylenyl-1H-benzimidazol-2-one derivatives. 4,604,468, Cl. 548-305.000.

Koppers Company, Inc.: *See—*
Dressler, Hans; and Meilus, Albert A., 4,604,491, Cl. 585-26.000.

Korolev, Georgy V.: *See—*
Naumov, Jury I.; Juzefovich, Dmitry K.; Epifanova, Valentina S.; Kucherenko, Vladimir I.; Flerov, Valery N.; Praporov, Anatoly M.; Shustov, Vladimir P.; Sychev, Alexel E.; Korolev, Georgy V.; Kotov, Evgeny P.; and Derevyanko, Yan N., 4,604,175, Cl. 204-151.000.

Kosak, Kenneth M. Bioluminescent tracer composition and method of use in immunoassays. 4,604,364, Cl. 436-501.000.

Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, to Toray Silicone Co., Ltd. Thermosetting epoxy resin compositions. 4,604,435, Cl. 525-476.000.

Koshimizu, Koichi: *See—*
Sakata, Isao; Nakajima, Susumu; Koshimizu, Koichi; Samejima, Natsuki; Inohara, Kazumi; and Takata, Hiroyuki, 4,604,241, Cl. 540-145.000.

Koshiyouji, Takashi: *See—*
Nakamura, Kunihiko; and Koshiyouji, Takashi, 4,603,849, Cl. 271-186.000.

Koslow, Evan E., to Pall Corporation. Fluid purifier. 4,604,109, Cl. 55-52.000.

Kosmach, Jerry C., to General Electric Company. Baseless incandescent lamp. 4,604,553, Cl. 313-315.000.

Koso International, Inc.: *See—*
Sibley, Richard D.; and Keller, William F., 4,603,591, Cl. 74-2.000.

Kosonocky, Walter F.: *See—*
Elabd, Hammam; Kosonocky, Walter F.; and Battson, Donald F., 4,604,652, Cl. 358-213.000.

Kotliar, Howard J. Taco holder. 4,603,825, Cl. 248-174.000.

Kotlicki, Moshe: *See—*
Kotlicki, Yaacov; and Kotlicki, Moshe, 4,604,524, Cl. 250-342.000.

Kotlicki, Yaacov; and Kotlicki, Moshe. Passive infra-red sensor. 4,604,524, Cl. 250-342.000.

Kotobuki & Co., Ltd.: *See—*
Yamamoto, Ken, 4,603,990, Cl. 401-85.000.
Yamamoto, Ken, 4,603,991, Cl. 401-86.000.

Kotov, Evgeny P.: *See—*
Naumov, Jury I.; Juzefovich, Dmitry K.; Epifanova, Valentina S.; Kucherenko, Vladimir I.; Flerov, Valery N.; Praporov, Anatoly M.; Shustov, Vladimir P.; Sychev, Alexel E.; Korolev, Georgy V.; Kotov, Evgeny P.; and Derevyanko, Yan N., 4,604,175, Cl. 204-151.000.

Koyama, Teruhisa: *See—*
Mitsuno, Tatsuyuki; Koyama, Teruhisa; and Ikezawa, Yuji, 4,604,421, Cl. 524-449.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Heumuller, Roland, 4,603,583, Cl. 73-596.000.

Kramer, John H.: *See—*
Edwards, David K.; and Kramer, John H., 4,604,024, Cl. 414-592.000.

Kramer, William M.: *See—*
Zollman, James A.; Kramer, William M.; and Rhoads, James L., 4,604,519, Cl. 250-213.0VT.

Kratel, Gunter; and Loskot, Stefan, to Wacker-Chemie GmbH. Process for the preparation of silicon tetrachloride. 4,604,272, Cl. 423-343.000.

Krause, Keith M., to Gates Rubber Company, The. Compounded polychloroprene formulation used as an adhesive layer in the manufacture of elastomeric articles. 4,603,712, Cl. 138-137.000.

Krausz, Frank. Trunk-twist exercise device. 4,603,854, Cl. 272-116.000.

Kremer, Henry A. F. L.: *See—*
Cukier, Samuel; and Kremer, Henry A. F. L., 4,604,184, Cl. 208-22.000.

Krengel, Theodore H., to Allied Tube & Conduit Corporation. Mill for roll forming a fluted tube. 4,603,807, Cl. 228-152.000.

Kresse, Franz: *See—*
Osberghaus, Rainer; Scheller, Bernfrid; Schunter, Roland; Kresse, Franz; and Schell, Helmut, 4,603,450, Cl. 15-147.00A.

Kretschmer, Horst: *See—*
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Franz-Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,603,998, Cl. 403-322.000.

Krishnakumar, Suppayan M.; Friendship, Kenneth F. M.; Mahajan, Gautam K.; and Pocock, John F. E., to Continental Group, Inc., The. Mold core member for use in a mold unit for injection molding a plastic material preform for a blow molded container. 4,603,831, Cl. 249-144.000.

Krog, Ann M.: *See—*
Deckner, George E.; Mercado, Clara G.; and Krog, Ann M., 4,604,281, Cl. 424-59.000.

Kroy Inc.: *See—*
Melbye, Kenneth M., 4,604,153, Cl. 156-235.000.

Kruehn, Juergen; and Prunbauer, Kurt, to Zeiss Ikon AG. Safety lock. 4,603,566, Cl. 70-380.000.

Krugh, Michael E., to Marathon Oil Company. Process for cleaning an oil field well bore hole using an internal casing wiper. 4,603,739, Cl. 166-311.000.

Kruk, Alexandr T.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Krupp Koppers GmbH: *See—*
Niermann, Hans; Kohnen, Klaus; and Jorde, Joachim, 4,603,588, Cl. 73-794.000.

Krupp Stahl AG: *See—*
Heinen, Karl-Heinz; Glitscher, Wolfgang; and Zorcher, Heinz, 4,604,135, Cl. 373-60.000.

Kruse, Marvin F. Hay bale loader. 4,604,018, Cl. 414-44.000.

Kubler, Joseph J.: *See—*
Chadima, George E., Jr.; and Kubler, Joseph J., 4,604,693, Cl. 364-200.000.

Kubota, Katsuhiko: *See—*
Yotsumoto, Yoshiharu; Kubota, Katsuhiko; and Sekiba, Toshinobu, 4,604,643, Cl. 357-75.000.

Kubota, Ltd.: *See—*
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, 4,603,753, Cl. 180-131.000.

Kucherenko, Vladimir I.: *See—*
Naumov, Jury I.; Juzefovich, Dmitry K.; Epifanova, Valentina S.; Kucherenko, Vladimir I.; Flerov, Valery N.; Praporov, Anatoly M.; Shustov, Vladimir P.; Sychev, Alexel E.; Korolev, Georgy V.; Kotov, Evgeny P.; and Derevyanko, Yan N., 4,604,175, Cl. 204-151.000.

Kuhfuss, Herbert F.: *See—*
Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,604,449, Cl. 528-288.000.

Kuhl, Jane F.; and Vicory, William A., to AT&T Bell Laboratories. Method for fusion splicing optical fiber. 4,604,119, Cl. 65-4.210.

Kuhl, Martin, to Hoechst CeramTec AG. Seal between a metallic mounting and a glass fiber rod in high voltage compound insulators and method of forming same. 4,604,498, Cl. 174-140.00S.

Kuhman, Jeffrey A. Method and apparatus for indicating dimensional relationships in plastic material feeding device during operation. 4,604,251, Cl. 264-40.200.

Kukucka, William P.; Sklut, Robert L.; and Gauronski, John F., to Xerox Corporation. Finisher mode switching. 4,603,971, Cl. 355-133.000.

Kulke, Gunter: *See—*
Grauel, Ingolf; Kulke, Gunter; Muller, Egbert; and Stumpe, Werner, 4,603,919, Cl. 303-6.00R.

Kumar, Binod: *See—*
Graves, George A., Jr.; and Kumar, Binod, 4,604,097, Cl. 623-11.000.

Kumobayashi, Hidenori; and Akutagawa, Susumu, to Takasago Perfumery Co., Ltd. Rhodium-phosphine complex. 4,604,474, Cl. 556-7.000.

Kumura, Haruyoshi: *See—*
Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, 4,603,602, Cl. 74-866.000.

Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, to Hoffmann-La Roche Inc.; and Takeda Chemical Industries Ltd. Homogeneous immune interferon fragment. 4,604,284, Cl. 424-85.000.

Kunieda, Masanori; Hiramatsu, Hiromichi; Higuchi, Toshiro; and Nakagawa, Takeo, to Aida Engineering, Ltd.; and Nakagawa, Takeo.

Magnetic attraction system grinding method. 4,603,509, Cl. 51-31.000.

Kunkle, Gerald E.: *See—*
Demarest, Henry M., Jr.; Matesa, Joseph M.; and Kunkle, Gerald E., 4,604,121, Cl. 65-27.000.

Kuno, Akira: *See—*
Yamanoue, Kouichi; Kitagawa, Junji; Akita, Shigeyuki; and Kuno, Akira, 4,603,581, Cl. 73-304.00C.

Kuranishi, Masaaki; Nonaka, Susumu; Furukawa, Koichi; and Siozaki, Fumio, to Sharp Kabushiki Kaisha. Recording member pressing device in a printer. 4,603,987, Cl. 400-639.100.

Kuraray Company, Ltd.: *See—*
Ueeda, Ryuhei; Fujii, Kiyonobu; and Narukawa, Hiroshi, 4,604,441, Cl. 526-351.000.

Kuroda, Masao: *See—*
Ide, Junya; Muramatsu, Shigeki; Tsujita, Yoshio; and Kuroda, Masao, 4,604,472, Cl. 549-292.000.

Kuroda, Shigeaki: *See—*
Suefuji, Kazutaka; Yasuda, Hiromu; Hayashi, Masakatsu; Arata, Tetsuya; Oguni, Kensaku; Kuroda, Shigeaki; Atsumi, Akira; Ishibane, Kyuhei; Terada, Hirokiyo; Senshu, Takao; and Kogure, Hiroshi, 4,603,556, Cl. 62-180.000.

Kuroki, Takashi: *See—*
Ishihara, Shosaku; Kuroki, Takashi; Toda, Gyozo; Yasukawa, Akio; and Sakamoto, Tatsuji, 4,604,496, Cl. 174-68.500.

Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., to Fairchild Camera & Instrument Corporation. Variation and control of bond force. 4,603,802, Cl. 228-1.100.

Kurz, Herbert: *See—*
Tax, Hans; and Kurz, Herbert, 4,603,783, Cl. 212-132.000.

Kusano, Hiroshi: *See—*
Kitsukawa, Tomohiko; Kusano, Hiroshi; Miyata, Eiji; and Sugawara, Toyokazu, 4,604,483, Cl. 562-443.000.

Kusmiss, Joseph M.: *See—*
Blount, Frederick T.; Capowski, Robert S.; Casper, Daniel F.; DelSonno, Lawrence R.; Geller, Robert F.; Kusmiss, Joseph M.; and Zimmerman, Terrence K., 4,604,709, Cl. 364-900.000.

Kuze, Katsuaki; Matsuyama, Yuziro; Yamaoka, Yoshio; Murashige, Ryuichi; and Makimura, Osamu, to Toyo Boseki Kabushiki Kaisha. Polyester composition. 4,604,453, Cl. 528-481.000.

Kverneland A/S: *See—*
Watvedt, Jorn, 4,603,745, Cl. 172-212.000.

Kyle, Robert C., to Minnesota Mining and Manufacturing Co. Cooking oil filtering apparatus and filter therefor. 4,604,203, Cl. 210-489.000.

Kyoritsu Kikai Co., Ltd.: *See—*
Sugihara, Toshihiko, 4,603,723, Cl. 160-35.000.

La Telemecanique Electrique: *See—*
Koehler, Gerard, 4,604,599, Cl. 335-230.000.

Labeeuw, Bernard; and Sahli, Ali, to Sanofi. 1,2,4-triazinylthiomethyl-3-cephem sulfoxides, and a procedure for their preparation. 4,604,387, Cl. 514-206.000.

"Labor" Muszeripari Muvek: *See—*
Benko, Eva; Csabanko, Istvan; Porkolab, Aniko ; Szabo, Zsolt; and Takacs, Gabor, 4,604,086, Cl. 494-16.000.

Labovitz, Jeffrey N.; and Fang, Lawrence, to Lafarge Coppee. Pollen suppressant comprising a fused pyridazine. 4,604,134, Cl. 71-92.000.

Labuhn, Walter: *See—*
Siebold, Quentin R.; and Labuhn, Walter, 4,603,592, Cl. 74-41.000.

Lacher, William A.: *See—*
Webler, Thomas N.; and Lacher, William A., 4,604,588, Cl. 331-135.000.

Laditka, Alexander. Apparatus for mixing and spreading coatings on surfaces. 4,603,999, Cl. 404-112.000.

Lafarge Coppee: *See—*
Labovitz, Jeffrey N.; and Fang, Lawrence, 4,604,134, Cl. 71-92.000.

Lagow, Ralph J., to Thermal Engine Technology. Method and apparatus for extracting useful energy from a superheated vapor actuated power generating device. 4,603,554, Cl. 60-670.000.

Lai, Jason C. S.: *See—*
Latz, William J.; Mandler, Thomas J.; and Lai, Jason C. S., 4,603,496, Cl. 40-547.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Bonneton, Michel; and Marchal, Bernard, 4,604,115, Cl. 62-11.000.
Desprez, Marc; and Laurenceau, Serge, 4,604,123, Cl. 65-134.000.

Lalancette, Jean M.; Chevalier-Bultel, Jean P.; and Desrosiers, Luc, to Societe Nationale de l'Amiante. Foundry sands derived from serpentine and foundry molds derived therefrom. 4,604,140, Cl. 106-38.900.

Lallemant, Bernard: *See—*
Joly, Jean-Louis; and Lallemant, Bernard, 4,603,796, Cl. 222-400.700.

Lam, Hon W., to Texas Instruments Incorporated. Method for source/drain self-alignment in stacked CMOS. 4,603,468, Cl. 29-571.000.

Lamort, Jean-Pierre J., to E et M Lamort S.A. Method and apparatus for sorting out a mixture of paper pulp and contaminants. 4,604,193, Cl. 209-273.000.

Lampe, Donald R.: *See—*
DelCoco, Robert J.; Borsuk, Gerald M.; and Lampe, Donald R., 4,604,650, Cl. 358-119.000.

Landa, Benzion. Lever operated friction clutch. 4,603,766, Cl. 192-99.00S.

Lander, George E.: *See—*
Gilmore, Robert L.; and Lander, George E., 4,603,515, Cl. 51-424.000.

Landmesser, John E.: *See—*
Douglas, Alan D.; Reilly, Kenneth T.; Landmesser, John E.; Landry, Richard E.; and MacInnis, Martin B., 4,604,265, Cl. 423-49.000.

Landry, Richard E.: *See—*
Douglas, Alan D.; Reilly, Kenneth T.; Landmesser, John E.; Landry, Richard E.; and MacInnis, Martin B., 4,604,265, Cl. 423-49.000.

Laneus, Per, to JCC Construction Company AB. Method of blasting rock caverns with large cross-sectional area. 4,603,910, Cl. 299-13.000.

Lang, Theodore B.: *See—*
McFarland, Timothy M.; and Lang, Theodore B., 4,604,313, Cl. 428-172.000.

Lange, Gottfried: *See—*
Feigt, Ingmar; Feldtkeller, Ernst; and Lange, Gottfried, 4,604,634, Cl. 346-160.000.

Lange, Joachim: *See—*
Maier, Gerhard; and Lange, Joachim, 4,604,571, Cl. 324-77.00A.

Lange, Robert: *See—*
Hertell, Siegfried; and Lange, Robert, 4,604,041, Cl. 418-82.000.

Langenbahn, Albert. Combination padded security lock and carrier therefor. 4,603,895, Cl. 292-295.000.

La Plante, Mark T.: *See—*
Boughton, Matthew S.; and La Plante, Mark T., 4,603,875, Cl. 280-272.000.

Large, Michael S.: *See—*
Yellin, Tobias O.; Edwards, Philip N.; and Large, Michael S., 4,604,465, Cl. 544-326.000.

Latz, William J.; Mandler, Thomas J.; and Lai, Jason C. S., to Adaptive Micro Systems, Inc. Electronic display with lens matrix. 4,603,496, Cl. 40-547.000.

Laughlin, John R.; and Mucha, George M., to Tocco, Inc. Method and apparatus for heat treating camshafts. 4,604,510, Cl. 219-10.430.

Laurenceau, Serge: *See—*
Desprez, Marc; and Laurenceau, Serge, 4,604,123, Cl. 65-134.000.

Layh, Hans-Dieter. AC tacho-generator. 4,604,537, Cl. 310-68.00R.

Layher, Ulrich. Metal pipe scaffolding. 4,603,756, Cl. 182-178.000.

Lebed, Alexandr D.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

LeBoeuf, Eugene A.: *See—*
Weaver, Leslie A., 4,603,908, Cl. 298-17.00R.

Lechner, Ernst F.; and Vache, Peter, to Siemens Aktiengesellschaft. Method and device for making a wrapped joint. 4,603,457, Cl. 29-33.00F.

Lecinski, Frank H., Jr.; and Thomas, William J., to Continental White Cap, Inc. Press-on closure for resealable glass finish. 4,603,786, Cl. 215-318.000.

Lee, Eldon C.; van Pottelsberghe de la Potterie, Pierre J.; and Tandy, John S., to Nestec S.A. Meat flavoring agents and process for preparing same. 4,604,290, Cl. 426-533.000.

Lee, Ho C.: *See—*
Helinski, Edward F.; and Lee, Ho C., 4,603,985, Cl. 400-167.000.

Lee, Woo G.: *See—*
Park, Jin Y.; O'Brien, Barry H.; and Lee, Woo G., 4,604,362, Cl. 436-34.000.

Legoupil, Jean-Luc: *See—*
Damiron, Pierre M.; Legoupil, Jean-Luc; and Brosson, Jacques, 4,604,157, Cl. 156-345.000.

Legrand Industries Ltd.: *See—*
Siebold, Quentin R.; and Labuhn, Walter, 4,603,592, Cl. 74-41.000.

Le Guen, Annick; and Moutarde, Joseph. Installation for the production of cheeses. 4,603,623, Cl. 99-454.000.

Lehfeldt, Carl L.: *See—*
Smith, Ronald A.; Jackson, James M.; Lehfeldt, Carl L.; Cygnarowicz, Leonard P.; Moshfegh, Khosro; Blanchard, Kenneth L.; and Nelson, Kenneth J., 4,603,567, Cl. 72-8.000.

Lehman, Cris R.: *See—*
Nelson, Charles R.; and Lehman, Cris R., 4,603,661, Cl. 122-392.000.

Lehmann, Werner: *See—*
Markgraf, Wilhelm; Lehmann, Werner; and Fecker, Rainer, 4,603,848, Cl. 271-125.000.

Lehrman, David. Non-skid ironing board cover. 4,603,494, Cl. 38-140.000.

Leiber, Heinz; and Bertling, Hannes, to Robert Bosch GmbH. Hydraulic dual-circuit tandem master brake cylinder. 4,603,918, Cl. 303-6.00R.

Leitzke, Ortwin; and Wolf, Ewald, to Messer Griesheim GmbH. Process for producing ozone. 4,604,279, Cl. 423-581.000.

Le Jeune, Gwenole . Device for separating phases for rigid multiphase materials. 4,603,909, Cl. 299-7.000.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
McGill, Kevin C.; and Dorfman, Leslie J., 4,603,703, Cl. 128-731.000.
Shaw, Herbert J.; Digonnet, Michel J. F.; Bergh, Ralph A.; Sorin, Wayne V.; and Kolner, Brian H., 4,603,940, Cl. 350-96.150.

Lemay, Richard A.: *See*—
Brown, Richard P.; Lemay, Richard A.; Steiner, G. Lewis; and Woods, William E., 4,604,685, Cl. 364-200.000.

Lemelson, Jerome H. Portable television camera and recording unit. 4,604,668, Cl. 360-10.100.

Leonard, Charles A.; Franko, Bernard V.; and Cale, Albert D., Jr., to A. H. Robins Company, Incorporated. Fused aromatic oxazepinones, thiazepinones, diazepinones and sulfur analogs thereof in a method of counteracting histamine. 4,604,388, Cl. 514-211.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 5-methyl(or ethyl)-1,6-naphthyridin-2(1H)-one 6-oxides, their preparation and the cardiotonic use thereof. 4,604,399, Cl. 514-300.000.

Lesniak, Thomas A., to McCord Heat Transfer Corporation. Means for retaining a radiator rigid. 4,604,015, Cl. 411-537.000.

Letoffe , Michel: *See*—
Donnadieu, Andre ; and Letoffe , Michel, 4,604,444, Cl. 528-34.000.

Leupold, Ernst I.: *See*—
Eichler, Klaus; and Leupold, Ernst I., 4,604,470, Cl. 549-81.000.

Levin, Robert E.; and English, George J., to GTE Products Corporation. Infrared floodlight. 4,604,680, Cl. 362-293.000.

Lew, Hyok S.; and Stranahan, Michael. Geodesically reinforced honeycomb structures. 4,603,519, Cl. 52-81.000.

Lew, Hyok S.; and Stranahan, Michael. Common apex double cone variable speed mechanical transmission. 4,603,595, Cl. 74-191.000.

Lewicki, Walter J., Jr.: *See*—
Creighton, Thomas C.; Dorsey, William C.; Lewicki, Walter J., Jr.; Long, Harry F.; and Ringer, Richard M., 4,604,312, Cl. 428-137.000.

Lewis, Gainer R. Electronic security system for externally powered devices. 4,604,708, Cl. 364-900.000.

Lewis, Henry G., Jr., to RCA Corporation. Coarse/fine automatic chrominance gain control using a gain adjustable IF amplifier in a digital television receiver. 4,604,645, Cl. 358-27.000.

Ley, Gregor: *See*—
Ammermann, Eberhard; Buschmann, Ernst; Ley, Gregor; and Pommer, Ernst-Heinrich, 4,604,429, Cl. 525-326.600.

Li, Wai Sau: *See*—
Chan, Lo Kwan; and Li, Wai Sau, 4,603,803, Cl. 228-4.500.

Lieberth, Karl, to Electrovac, Fabrikation elektronischer Spezialartikel Gesellschaft m.b.H. Device for regulating or limiting at least one temperature value or a temperature range of radiation or contact heaters of electric cooking apparatus. 4,603,981, Cl. 374-210.000.

Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,603,800, Cl. 226-119.000.

Liggett, John V., to Rockwell International Corporation. Brake proportioning system. 4,603,921, Cl. 303-6.00C.

Lillie, Christian: *See*—
Reiffen, Manfred; Noll, Klaus; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,604,389, Cl. 514-213.000.

Lim, Basilio Y. Combination of a laser and a controller for trimming a metallized dielectric film capacitor. 4,604,513, Cl. 219-121.0LA.

Lin, Albert M., to AT&T Bell Laboratories. Controlled boron doping of silicon. 4,604,150, Cl. 148-188.000.

Lin, Chung-Yuan, to Dow Chemical Company, The. Method for removing cyclic phosphorus contaminants from organic substrates. 4,604,210, Cl. 210-690.000.

Lin, Tai-Shun; and Prusoff, William H., to Research Corporation. 3'-amino-2',3'-dideoxycytidine and the pharmacologically acceptable salts thereof. 4,604,382, Cl. 514-49.000.

Linde Aktiengesellschaft: *See*—
Burr, Peter S., 4,604,107, Cl. 55-17.000.
Halbmann, Manfred, 4,603,557, Cl. 62-255.000.

Linder, Charles; and Perry, Mordechai, to Aligena AG. Porous, semipermeable membranes of chemically modified cellulose acetate. 4,604,204, Cl. 210-490.000.

Lindsay, James H.: *See*—
Liu, Sonya W.; and Lindsay, James H., 4,604,168, Cl. 204-30.000.

Lindsey, Hiram E., Jr., to MWL Tool & Supply Company. Hydraulic/-mechanical setting tool and liner hanger. 4,603,743, Cl. 166-382.000.

Lintunen, Tuomo, to Enso-Gutzeit Oy. Filter press for thickening cellulose pulp or sludge. 4,604,195, Cl. 210-131.000.

Lippert, Thomas E.: *See*—
Ciliberti, David F.; and Lippert, Thomas E., 4,604,112, Cl. 55-117.000.

Littelfuse, Inc.: *See*—
Borzoni, John, 4,604,602, Cl. 337-264.000.

Littlebury, Hugh; and Swapp, Mavin, to Motorola Inc. Automated circuit tester. 4,604,744, Cl. 371-20.000.

Littleton, Floyd B., Jr.: *See*—
Nall, Kenneth L.; and Littleton, Floyd B., Jr., 4,603,626, Cl. 100-215.000.

Liu, Peter D. Transmission enhancing coating. 4,604,297, Cl. 427-64.000.

Liu, Ping Y., to General Electric Company. Composition. 4,604,423, Cl. 524-508.000.

Liu, Sonya W.; and Lindsay, James H., to General Motors Corporation. Pretreatment for electroplating mineral-filled nylon. 4,604,168, Cl. 204-30.000.

Liukko, Lasse. Method of making a stitched and bonded seam. 4,604,152, Cl. 156-93.000.

Livesey, James R.; Hart, William; and Hartleben, Harold A., to Mattel, Inc. Take-apart rocking stack toy. 4,604,073, Cl. 446-117.000.

Llanos, Orestes L. Mousetrap. 4,603,504, Cl. 43-76.000.

Lobanov, Nikolai A.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Lockheed Electronics Company, Inc.: *See*—
Strenkowski, John G.; and Yang, John P., 4,604,582, Cl. 328-55.000.

Loctite Corporation: *See*—
Humphreys, Robert W. R., 4,604,295, Cl. 427-54.100.

Loevinger, Richard. Heated railroad tank car. 4,603,733, Cl. 165-41.000.

Long, Harry F.: *See*—
Creighton, Thomas C.; Dorsey, William C.; Lewicki, Walter J., Jr.; Long, Harry F.; and Ringer, Richard M., 4,604,312, Cl. 428-137.000.

Long, John V.: *See*—
Gagliani, John; and Long, John V., 4,604,409, Cl. 521-157.000.

Long, Robert A.: *See*—
Czupryna, Gary; Natansohn, Samuel; Long, Robert A.; and Munn, Robin W., 4,604,273, Cl. 423-344.000.

Loose, Richard D.; and Struck, Joseph W., to General Motors Corporation. Seat belt retractor. 4,603,819, Cl. 242-107.40A.

Lopez, Jairo: *See*—
Klaus, Irving; Herbstman, Warren; and Lopez, Jairo, 4,604,059, Cl. 433-217.100.

L'Oreal: *See*—
Grollier, Jean-Francois; and Allec, Josiane, 4,604,282, Cl. 424-74.000.

Lorient Polyproducts Ltd.: *See*—
Mann, Robert, 4,603,524, Cl. 52-232.000.

Loskot, Stefan: *See*—
Kratel, Gunter; and Loskot, Stefan, 4,604,272, Cl. 423-343.000.

Louboutin, Robert; and Gibaud, Jean, to Degremont. Submerged filter filled with granular material. 4,604,197, Cl. 210-150.000.

Louie, Kenneth: *See*—
Mlinar, Mitchell J.; Louie, Kenneth; and Piotrowski, Wieslaw S., 4,604,590, Cl. 333-1.100.

Louis, George A., to United States of America, Energy. Fuel cell separator plate with bellows-type sealing flanges. 4,604,331, Cl. 429-35.000.

Loveless, John H.: *See*—
Seamone, Woodrow; and Loveless, John H., 4,604,098, Cl. 623-60.000.

Lowenthal, Douglas H.: *See*—
Rahn, Kenneth A.; and Lowenthal, Douglas H., 4,603,575, Cl. 73-28.000.

Lowery, Archie J. Pendant line connecting link. 4,604,002, Cl. 405-224.000.

Lowrie, Neely E.; and Rooker, Mitchel L., to Combustion Engineering, Inc. Marine separator for fluids of different densities. 4,604,196, Cl. 210-136.000.

Lozinski, Gerald J.: *See*—
Toutant, Roy T.; and Lozinski, Gerald J., 4,604,715, Cl. 364-513.000.

Lubrizol Corporation, The: *See*—
Bryant, Charles P.; and Gerdes, Harold M., 4,604,221, Cl. 252-51.50A.

Lucas Industries public limited company: *See*—
Bernd-Holger, Rohling, 4,603,761, Cl. 188-73.450.

Lucasfilm Ltd.: *See*—
Abbott, Curtis W., 4,604,687, Cl. 364-200.000.

Luckow, Herbert: *See*—
Grosse-Wordemann, Josef; and Luckow, Herbert, 4,604,511, Cl. 219-76.140.

Luegering, Gregory J., to Insta-Foam Products, Inc. Double back spray nozzle. 4,603,813, Cl. 239-399.000.

Luhleich, Hartmut; and Dias, Francisco J., to Kernforschungsanlage Julich GmbH. Method of producing composite armor plate bodies. 4,604,249, Cl. 264-29.500.

Lukach, Carl; and Sun, Shao-Tang, to Hercules Incorporated. Gelled aqueous compositions. 4,604,217, Cl. 252-8.55R.

Lumer, Yakov L.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Lund, Gary K., to Dow Chemical Company, The. Catalyst prepared from organomagnesium compound, epihalohydrin reducing halide source and transition metal compound. 4,604,374, Cl. 502-115.000.

Lundberg, Michael R.: *See*—
Brown, Sanford S.; Hunsberger, Dennis J.; and Lundberg, Michael R., 4,604,500, Cl. 179-18.0ES.

Luoma, Eugene H. Bow drawback mechanism. 4,603,676, Cl. 124-25.000.

Luthra, Ajay K.; Kassam, Saleem; and Bernardi, Richard B., to Interspec, Inc. Body imaging using vectorial addition of acoustic reflection to achieve effect of scanning beam continuously focused in range. 4,604,697, Cl. 364-414.000.

Lutz, Irvin H.; and Wilson, Thomas M., to DM International Inc. Process for upgrading residuums by combined donor visbreaking and coking. 4,604,186, Cl. 208-50.000.

Luukkala, Mauri: *See—*
Matilainen, Aarre; and Luukkala, Mauri, 4,603,979, Cl. 374-54.000.

Luz, Rudolf; and Gartner, Gunter, to Rieter Machine Works, Ltd. Bobbin inserting device. 4,603,818, Cl. 242-35.50A.

Lyons, George W., Jr., to Bilco Company, The. Corner patch support. 4,603,517, Cl. 52-60.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Heeren, Hermann; and Wendel, Wilhelm, 4,603,734, Cl. 165-67.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Schubert, Johannes M.; and Geuppert, Gerhard, 4,603,633, Cl. 101-366.000.
Simeth, Claus, 4,603,631, Cl. 101-229.000.

MacDonald, Margaret H.: *See—*
MacDonald, Richard, 4,603,502, Cl. 43-41.000.

MacDonald, Richard, to MacDonald, Margaret H. Fishing lure assembly. 4,603,502, Cl. 43-41.000.

Machart, Ronald C., Jr., to IGC, Inc. Fluid filter with uniform spacing. 4,604,200, Cl. 210-314.000.

Machida, Kaoru, to Kabushiki Kaisha Toshiba. Ultrasonic flowmeter. 4,603,589, Cl. 73-861.280.

MacInnis, Martin B.: *See—*
Douglas, Alan D.; Reilly, Kenneth T.; Landmesser, John E.; Landry, Richard E.; and MacInnis, Martin B., 4,604,265, Cl. 423-49.000.

Mackenzie, Peter B., to Can-Eng Holdings, Ltd. Lip-hung retort furnace. 4,604,055, Cl. 432-58.000.

MacLeay, Ronald E., to Pennwalt Corporation. Process of preparing azoalkane mixture containing at least one unsymmetrical azoalkane. 4,604,455, Cl. 534-587.000.

Maebayashi, Jiro: *See—*
Kijima, Takao; and Maebayashi, Jiro, 4,603,882, Cl. 280-701.000.

Maggi, Carlo Alberto: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Maggi, Carlo Alberto; Roncucci, Gabrio; and Meli, Alberto, 4,604,392, Cl. 514-227.000.

Mahajan, Gautam K.: *See—*
Krishnakumar, Suppayan M.; Friendship, Kenneth F. M.; Mahajan, Gautam K.; and Pocock, John F. E., 4,603,831, Cl. 249-144.000.

Mahant-Shetti, Shivaling S.: *See—*
Shah, Ashwin H.; Chatterjee, Pallab K.; Gallia, James D.; and Mahant-Shetti, Shivaling S., 4,604,727, Cl. 365-189.000.

Mahle GmbH: *See—*
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Maier, Gerhard; and Lange, Joachim, to Deutsche Thomson-Brandt GmbH. Circuit for the determination of voltage extrema. 4,604,571, Cl. 324-77.00A.

Majerus, Norbert: *See—*
Greenwood, Alan; and Majerus, Norbert, 4,604,256, Cl. 264-501.000.

Makarov, Nikolai P.: *See—*
Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., 4,604,724, Cl. 364-478.000.

Makihara, Norimitsu: *See—*
Inagaki, Syoji; Sanpe, Hideyuki; and Makihara, Norimitsu, 4,604,560, Cl. 318-567.000.

Makimura, Osamu: *See—*
Kuze, Katsuaki; Matsuyama, Yuziro; Yamaoka, Yoshio; Murashige, Ryuichi; and Makimura, Osamu, 4,604,453, Cl. 528-481.000.

Makino, Tetsuo: *See—*
Fujiwara, Haruyoshi; and Makino, Tetsuo, 4,604,164, Cl. 162-343.000.

Maloney, Kevin, to Cosco, Inc. Foldable high chair. 4,603,902, Cl. 297-35.000.

Malpass, Gerald D., Jr., to Hercules Incorporated. Halogen-free, high flash point reactant solution. 4,604,447, Cl. 526-189.000.

Mamatsashvili, Vasha I.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Manabe, Seiichi; Iwata, Michitaka; and Inoue, Mamoru, to Asahi Kasei Kogyo Kabushiki Kaisha. Porous regenerated cellulose hollow fiber and process for preparation thereof. 4,604,326, Cl. 428-398.000.

Manchester R & D Partnership: *See—*
Fergason, James L., 4,603,945, Cl. 350-331.00R.

Mandler, Thomas J.: *See—*
Latz, William J.; Mandler, Thomas J.; and Lai, Jason C. S., 4,603,496, Cl. 40-547.000.

Mann, Joseph M., to International Harvester Company. Vapor emitting wear indicator. 4,604,604, Cl. 340-52.00A.

Mann, Robert, to Lorient Polyproducts Ltd. Fire resistant glazing system. 4,603,524, Cl. 52-232.000.

Manton, John C.; Bruckert, William F.; and Dellicicchi, Alfred J., to Digital Equipment Corporation. Pipeline error correction. 4,604,750, Cl. 371-38.000.

Manunta, Giorgio: *See—*
Rolando, Giovanni; and Manunta, Giorgio, 4,604,679, Cl. 362-277.000.

Mar-Mex International, Ltd.: *See—*
Meschke, Juergen, 4,603,755, Cl. 182-5.000.

Marathon Corporation: *See—*
Fenner, Gordon H.; and Brown, Ronald L., 4,603,625, Cl. 100-53.000.

Marathon Oil Company: *See—*
Krugh, Michael E., 4,603,739, Cl. 166-311.000.

Marchal, Bernard: *See—*
Bonneton, Michel; and Marchal, Bernard, 4,604,115, Cl. 62-11.000.

Marcon Electronics Co., Ltd.: *See—*
Kaneko, Shinichi, 4,603,467, Cl. 29-570.000.

Marconi Company Limited, The: *See—*
Davies, George G.; McGlade, Stuart M.; and Dunn, Peter L., 4,604,725, Cl. 364-900.000.
McGann, Melvyn, 4,604,589, Cl. 332-37.00R.

Marianelli, Giorgio: *See—*
Barbieri, Raul; and Marianelli, Giorgio, 4,603,883, Cl. 281-45.000.

Marinaccio, Paul J.: *See—*
Chu, Chaokang; Fiore, Joseph V.; Knight, Rodney A.; Marinaccio, Paul J.; and Roy, Asit, 4,604,208, Cl. 210-636.000.

Markert, Helmut: *See—*
von Gentzkow, Wolfgang; Hodl, Maximilian; Kleeberg, Wolfgang; and Markert, Helmut, 4,604,314, Cl. 428-209.000.

Markfelder, Gunter: *See—*
Hofmann, Heinrich; and Markfelder, Gunter, 4,603,983, Cl. 384-512.000.

Markgraf, Wilhelm; Lehmann, Werner; and Fecker, Rainer, to Mathias Bauerle GmbH. Sheet separator including passage gap adjusting mechanism for separating sheets of various thicknesses from a stack of sheets. 4,603,848, Cl. 271-125.000.

Marotta, Joseph J., to Xerox Corporation. Toner bottle for copier/-printing machines. 4,603,714, Cl. 141-383.000.

Marr, Robert: *See—*
Wynnyckyj, John R.; Rhodes, Edward; and Marr, Robert, 4,603,660, Cl. 122-379.000.

Mars Incorporated: *See—*
Cowles, John C., 4,604,557, Cl. 318-98.000.

Martin, Carl J.: *See—*
Carr, Richard V. C.; Martin, Carl J.; Gonzalez, Roland; and Albanese, Thomas A., 4,604,214, Cl. 210-759.000.

Martin, Donald A.: *See—*
Merrill, Thomas A.; and Martin, Donald A., 4,604,538, Cl. 310-68.00D.

Martin Marietta Corporation: *See—*
Reiter, Bernadette G.; Castor, John W.; Blume, R. J. Carter; Schewe, Roy A.; and Shepley, Leonard D., 4,604,686, Cl. 364-200.000.

Martinek, Thomas W., to Teepak, Inc. Sausage casing automatic closing method. 4,604,085, Cl. 493-259.000.

Martinelli, Giuseppe. Device for maintaining a constant oil level. 4,603,666, Cl. 123-196.00S.

Martinez Llaneza, Manuel, to Investronica, S.A. Machine for continuously perforating wide paper. 4,603,630, Cl. 101-227.000.

Maruyama, Shigeyuki: *See—*
Horiuchi, Akinori; Binnaka, Toshio; and Maruyama, Shigeyuki, 4,604,572, Cl. 324-158.00F.

Maruyama, Yuji; and Horinishi, Katsumi, to West Electric Company, Ltd. Automatic electronic flash. 4,603,958, Cl. 354-414.000.

Mary A. Thomas, executrix: *See—*
Thomas, Robert H., deceased; Mary A. Thomas, executrix; Hammond, Willis B.; Friedberger, Michael P.; and Archie, William A., 4,604,316, Cl. 428-265.000.

Mashimo, Satoshi; Tanaka, Masayuki; Yamaguchi, Yoshio; and Kinoshita, Takashi, to Mitsuboshi Belting Ltd. Toothed belt. 4,604,081, Cl. 474-205.000.

Masonite Corporation: *See—*
Prior, William L.; and Sargeant, William C., 4,604,318, Cl. 428-289.000.

Massachusetts Institute of Technology: *See—*
Bell, Eugene; and Dubertret, Louis, 4,604,346, Cl. 435-1.000.

Masteller, Sara B.: *See—*
Fujawa, Charles S.; and Masteller, Sara B., 4,604,701, Cl. 364-431.010.

Masuda, Tsugunori: *See—*
Takeda, Kota; and Masuda, Tsugunori, 4,603,804, Cl. 228-40.000.

Matano, Masaharu: *See—*
Yamashita, Tsukasa; Inoue, Nobuhisa; Mori, Kazuhiko; and Matano, Masaharu, 4,604,707, Cl. 364-822.000.

Matesa, Joseph M.: *See—*
Demarest, Henry M., Jr.; Matesa, Joseph M.; and Kunkle, Gerald E., 4,604,121, Cl. 65-27.000.

Mathias Bauerle GmbH: *See—*
Markgraf, Wilhelm; Lehmann, Werner; and Fecker, Rainer, 4,603,848, Cl. 271-125.000.

Mathiesen, Lars. Separable piece of furniture. 4,603,906, Cl. 297-440.000.

Matilainen, Aarre; and Luukkala, Mauri. Procedure and means for measuring the internal friction of liquid substances. 4,603,979, Cl. 374-54.000.

Matsuda, Hideo, to Kabushiki Kaisha Toshiba. Five layer semiconductor device with separate insulated turn-on and turn-off gates. 4,604,638, Cl. 357-23.400.

Matsuda, Naotoshi; and Tamatani, Masaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Orange-yellow emitting phosphor and cathode-ray tube employing the same. 4,604,549, Cl. 313-468.000.

Matsuda, Yoichi: *See*—
Murakami, Kanji; Akahoshi, Haruo; Kawamoto, Mineo; Wajima, Motoyo; Matsuda, Yoichi; Kawakubo, Kyoji; Kanechiku, Minoru; Yoshimura, Toyofusa; and Matsunaga, Makoto, 4,604,160, Cl. 156-630.000.

Matsui, Shougo, to Fujitsu Limited. Reticle used in semiconductor device fabrication and a method for inspecting a reticle pattern thereon. 4,603,974, Cl. 356-394.000.

Matsumoto, Akio: *See*—
Yokota, Mitsuyoshi; Matsumoto, Akio; and Morishita, Mitsuharu, 4,604,565, Cl. 320-15.000.

Matsumoto, Hiroaki, to Canon Kabushiki Kaisha. Recorder transport for perforating and cutting operations. 4,604,632, Cl. 346-24.000.

Matsumoto, Shusaku: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,604,411, Cl. 522-14.000.

Matsumura, Hiroyoshi; Katsuyama, Toshio; Ohta, Norio; Suganuma, Tsuneo; Nagatsuma, Kazuyuki; and Sugita, Yutaka, to Hitachi, Ltd. Temperature-compensated magnetic field measuring instrument. 4,604,577, Cl. 324-244.000.

Matsunaga, Makoto: *See*—
Murakami, Kanji; Akahoshi, Haruo; Kawamoto, Mineo; Wajima, Motoyo; Matsuda, Yoichi; Kawakubo, Kyoji; Kanechiku, Minoru; Yoshimura, Toyofusa; and Matsunaga, Makoto, 4,604,160, Cl. 156-630.000.

Matsunata, Yuso, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of compensating a profiling direction of a profiling machine. 4,603,487, Cl. 33-551.000.

Matsuno, Mitsuo: *See*—
Yuasa, Hitoshi; Matsuno, Mitsuo; and Imai, Hirosuke, 4,604,490, Cl. 585-21.000.

Matsuoka, Hideoki, to Nissan Motor Co., Ltd. Steering system equipped with steering wheel center pad anti-rotation mechanism. 4,603,599, Cl. 74-492.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Yano, Nobuyuki; Inami, Takashi; Ieki, Mitsuru; and Wakai, Masao, 4,603,460, Cl. 29-157.30V.

Matsushita Electric Works, Ltd.: *See*—
Akiba, Osamu; Suzuki, Yoshiharu; Terada, Motoharu; and Saeki, Takashi, 4,604,618, Cl. 340-825.060.
Yokoyama, Yoichi; and Kondo, Hideya, 4,604,596, Cl. 335-14.000.

Matsushita Seiko Co., Ltd.: *See*—
Yano, Nobuyuki; Inami, Takashi; Ieki, Mitsuru; and Wakai, Masao, 4,603,460, Cl. 29-157.30V.

Matsutoh, Takushi; Wakatsuki, Goroei; Kitamura, Yoshitaka; and Ishihara, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Drive system for engine-driven light vehicles. 4,603,754, Cl. 180-221.000.

Matsuura, Ryoichi: *See*—
Otsuki, Hiromi; Matsuura, Ryoichi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,603,920, Cl. 303-10.000.

Matsuyama, Yuziro: *See*—
Kuze, Katsuaki; Matsuyama, Yuziro; Yamaoka, Yoshio; Murashige, Ryuichi; and Makimura, Osamu, 4,604,453, Cl. 528-481.000.

Mattel, Inc.: *See*—
Livesey, James R.; Hart, William; and Hartleben, Harold A., 4,604,073, Cl. 446-117.000.
St. Pierre, Raymond M., 4,604,076, Cl. 446-418.000.

Mattell, Inc.: *See*—
Engle, T. Scott; and Poznick, Jeffrey B., 4,604,074, Cl. 446-171.000.

Matz, Gary F., to Calgon Corporation. Use of copolymers of carboxylic monomer and betaine-containing monomer as corrosion and scale inhibitors. 4,604,212, Cl. 210-700.000.

Maxwell, Eugene O. Helicopter ground handling wheel assembly. 4,603,869, Cl. 280-11.000.

Maxwell, Gary L.: *See*—
Borcherdt, Roger D.; Fletcher, Jon P.; Warrick, Richard E.; Maxwell, Gary L.; Jensen, Edward G.; and Schaack, John V., 4,604,699, Cl. 364-420.000.

May & Baker Limited: *See*—
Collins, Raymond F.; Ramsden, Christopher A.; Saunders, Libert C.; and Warne, Peter J., 4,604,400, Cl. 514-300.000.

Mayer, Rayner M., to British Petroleum Company p.l.c., The. Apparatus for containing an energy storage flywheel. 4,603,555, Cl. 60-721.000.

Mayfield, Terry D.; and Kendrick, William D., to Halliburton Company. Rigid adjustable length assembly. 4,603,887, Cl. 285-32.000.

Mazda Motor Corporation: *See*—
Hiraoka, Shin; Asanomi, Koji; and Abe, Ryoji, 4,603,673, Cl. 123-573.000.
Kijima, Takao; and Maebayashi, Jiro, 4,603,882, Cl. 280-701.000.

Maziasz, Daniel E. Three-dimensional fireplace insert. 4,603,682, Cl. 126-120.000.

McAdams, Michael J. Receptacle for mounting in a freezer for assisting in the defrosting thereof. 4,603,558, Cl. 62-272.000.

McArdel, Richard C., to Boeing Company, The. Wing slat anti-ice air duct system with improved slide bearings and air seal. 4,603,824, Cl. 244-134.00B.

McCall, Clyde A.; Campbell, Michael J.; and Dean, William B., to Chicopee. High bulk, biaxial elastic, heat shrunk fabric. 4,604,315, Cl. 428-230.000.

McConaghy, James R., Jr.; and Anderson, Ardis L., to Conoco Inc. Co-processing of straight run vacuum resid and cracked residua. 4,604,185, Cl. 208-56.000.

McCord Heat Transfer Corporation: *See*—
Lesniak, Thomas A., 4,604,015, Cl. 411-537.000.

McCorkle, Richard A.: *See*—
Becker, Alan R.; McCorkle, Richard A.; Miller, Robert A.; and Plessl, Gary J., 4,604,027, Cl. 414-749.000.

McCormack, John F.: *See*—
De Luca, Michael A.; and McCormack, John F., 4,604,299, Cl. 427-98.000.

McCorquodale, Robert P., to Kenox Corporation. Wet oxidation system. 4,604,215, Cl. 210-762.000.

McCulloch Corporation: *See*—
Jackson, Robert V., 4,603,664, Cl. 123-149.00D.

McDonie, Arthur F.; and Faulkner, Richard D., to RCA Corporation. Photomultiplier tube having a high resistance dynode support spacer anti-hysteresis pattern. 4,604,545, Cl. 313-105.0CM.

McFarland, Timothy M.; and Lang, Theodore B., to Kimberly-Clark Corporation. Selective layering of superabsorbents in meltblown substrates. 4,604,313, Cl. 428-172.000.

McGann, Melvyn, to Marconi Company Limited, The. High frequency circuit. 4,604,589, Cl. 332-37.00R.

McGill, Kevin C.; and Dorfman, Leslie J., to Leland Stanford Junior University, The Board of Trustees of the. Method for real-time detection and identification of neuroelectric signals. 4,603,703, Cl. 128-731.000.

McGlade, Stuart M.: *See*—
Davies, George G.; McGlade, Stuart M.; and Dunn, Peter L., 4,604,725, Cl. 364-900.000.

McGuire, Kathleen M.: *See*—
Beckham, Keith F.; Kolman, Anne E.; McGuire, Kathleen M.; Puttlitz, Karl J.; and Quinones, Horatio, 4,604,644, Cl. 357-80.000.

McIntosh, Kenneth B.; and Howard, Clyde. Liftable top for pickup trucks. 4,603,901, Cl. 296-165.000.

McKee, Bruce C.; and Ross, Mitchell S. Ski board having angularly adjustable binding. 4,604,070, Cl. 441-70.000.

McKeighan, Ronald E.: *See*—
Hwang, Juin-Jet; McKeighan, Ronald E.; and Jaeger, Paul M., 4,603,702, Cl. 128-660.000.

McKiernan, Patrick N., to Goodyear Tire & Rubber Company, The. Method of making a multi-layered pressure hose utilizing internal fluid pressure. 4,604,155, Cl. 156-287.000.

McLaren, John W.: *See*—
Stoesser, Paul R.; Cuzic, John E.; and McLaren, John W., 4,603,812, Cl. 239-329.000.

McNeill, Samuel J., to Schwend, Fred N., a part interest. Wheel for shopping cart or the like. 4,603,871, Cl. 280-33.99C.

Medlin, Lewis B., Sr. Extension bracket for mounting electrical outlet box. 4,603,789, Cl. 220-3.900.

Medtronic, Inc.: *See*—
Cross, Thomas E., Jr.; and Hults, Gerald J., 4,603,696, Cl. 128-419.00P.

Medwed, Emmerich, to Multivac Sepp Haggenmuller KG. Packaging machine. 4,603,541, Cl. 53-561.000.

Mehltretter, James C.; Woodard, Winfred L., III; Orlando, John J.; and Goodrich, Charles B., to Inco Alloys International, Inc. System for discharging rotary mills. 4,603,814, Cl. 241-30.000.

Meilus, Albert A.: *See*—
Dressler, Hans; and Meilus, Albert A., 4,604,491, Cl. 585-26.000.

Meins, Juergen: *See*—
Miller, Luitpold; Knoll, Helmut; and Meins, Juergen, 4,603,640, Cl. 104-282.000.

Meister, Klaus: *See*—
Meyers, Pierre; and Meister, Klaus, 4,604,605, Cl. 340-365.00R.

Melbye, Kenneth M., to Kroy Inc. Method of manufacturing figures from a laminated tape and applying the same to a desired medium. 4,604,153, Cl. 156-235.000.

Meli, Alberto: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Maggi, Carlo Alberto; Roncucci, Gabrio; and Meli, Alberto, 4,604,392, Cl. 514-227.000.

Mentrup, Anton: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muaceic, Gojko, 4,604,468, Cl. 548-305.000.

Mercado, Clara G.: *See*—
Deckner, George E.; Mercado, Clara G.; and Krog, Ann M., 4,604,281, Cl. 424-59.000.

Merchant, Gulamabbas A.: *See*—
Thadani, Suresh G.; and Merchant, Gulamabbas A., 4,604,581, Cl. 324-339.000.

Merck & Co., Inc.: *See*—
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,604,396, Cl. 514-256.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,604,403, Cl. 514-425.000.
Kaczorowski, Gregory J.; and Siegl, Peter K. S., 4,604,394, Cl. 514-255.000.

Merlin Gerin: *See*—
Barrault, Michel R., 4,604,576, Cl. 324-208.000.

Merrill, Darrell L. Hitch-borne vehicle transport. 4,603,874, Cl. 280-402.000.

Merrill, Thomas A.; and Martin, Donald A., to General Motors Corporation. Air cooling for diode-rectified alternating current generators. 4,604,538, Cl. 310-68.00D.

Meschke, Juergen, to Mar-Mex International, Ltd. Rappel line clamp and harness. 4,603,755, Cl. 182-5.000.

Messer Griesheim GmbH: *See*—
Leitzke, Ortwin; and Wolf, Ewald, 4,604,279, Cl. 423-581.000.

Metz, Bruce E., to Athena Controls Inc. Cascaded arrangement for electrically heating fluids to high temperature. 4,604,516, Cl. 219-379.000.

Metzeler Kautschuk GmbH: *See*—
Hundt, Werner; and Wagner, Bernd, 4,603,997, Cl. 403-228.000.

Meyer, Hans; and Hartmann, Viggo E., to A/S Kaj Neckelmann, Syntetisk Fiber Industri. Bobbin supporting textile strands to be subjected to a heat and/or wet treatment. 4,603,562, Cl. 68-198.000.

Meyer, William D. Tiltable game pieces for use with board games. 4,603,863, Cl. 273-282.000.

Meyers, George; and Mueller, David C., to Garber Company, The. Glassware package. 4,603,779, Cl. 206-426.000.

Meyers, Pierre; and Meister, Klaus. Safety device for manually operable code generation. 4,604,605, Cl. 340-365.00R.

Mich, Thomas F.; Culbertson, Townley P.; and Domagala, John M., to Warner-Lambert Company. Antibacterial agents III. 4,604,401, Cl. 514-312.000.

Michalek, Jiri: *See*—
Wichterle, Otto; Trekoval, Jiri; Vacik, Jiri; and Michalek, Jiri, 4,604,440, Cl. 526-327.000.

Michel, Karl H.; and Kastner, Ralph E., to Eli Lilly and Company. Antibiotics. 4,604,239, Cl. 530-317.000.

Michigan Biotechnology Institute: *See*—
Zeikus, Joseph G.; and Hyun, Hyung-Hwan, 4,604,352, Cl. 435-42.000.

Michisita, Kazuo: *See*—
Suzuki, Go; and Michisita, Kazuo, 4,604,677, Cl. 361-393.000.

Micro Control Technology Limited: *See*—
Moir, Christopher I., 4,604,526, Cl. 250-561.000.

Middleton, Frederic H.; Mollenhoff, David V.; Taylor, Theodore L.; and Vaughn, Thomas N., to MTV Associates. Rotary electric toothbrush. 4,603,448, Cl. 15-22.00R.

Middleton, Harold G. Inertial dynamometer system and method for measuring and indicating gross horsepower. 4,603,582, Cl. 73-511.000.

Mifune, Hiroyuki: *See*—
Sugimoto, Tadao; Ikeda, Hideo; Mifune, Hiroyuki; and Nakamura, Koki, 4,604,339, Cl. 430-244.000.

Mikina, Stanley J. Drum brake with negative feedback for brake shoe friction compensation. 4,603,763, Cl. 188-334.000.

Mikina, Stanley J. Vehicle suspension. 4,603,881, Cl. 280-675.000.

Mikiya, Toshio: *See*—
Shoji, Mitihiro; and Mikiya, Toshio, 4,604,006, Cl. 408-76.000.

Miles, Kevin; M., to Miles, Micheal; Dubler, Alfred; Diebold, Rick; and Dubler, David. Dual-stream envelope feeder. 4,603,846, Cl. 271-2.000.

Miles Laboratories, Inc.: *See*—
Blake, Robert C., II, 4,604,356, Cl. 435-194.000.

Miles, Micheal: *See*—
Miles, Kevin; M., 4,603,846, Cl. 271-2.000.

Millard, Lance. Portable electronic insect controller. 4,603,505, Cl. 43-112.000.

Miller, Luitpold; Knoll, Helmut; and Meins, Juergen, to Thyssen Industrie AG. Device for incrementally identifying the vehicle position of a magnet levitation vehicle. 4,603,640, Cl. 104-282.000.

Miller, Richard E. Thread vise. 4,603,605, Cl. 81-53.200.

Miller, Robert A.: *See*—
Becker, Alan R.; McCorkle, Richard A.; Miller, Robert A.; and Plessl, Gary J., 4,604,027, Cl. 414-749.000.

MIM Industries, Inc.: *See*—
Conley, Ralph F., Jr.; and Frye, Ricky F., 4,603,647, Cl. 112-129.000.

Mimura, Yoshiyuki; and Toda, Akitoshi, to Olympus Optical Co., Ltd. Electrophotographic color copying paper and copying method making use of the same. 4,604,337, Cl. 430-46.000.

Min, Young-Kee, to PT Components, Inc. Electronic switch for starting AC motor. 4,604,563, Cl. 318-786.000.

Minnesota Mining and Manufacturing Co.: *See*—
Kyle, Robert C., 4,604,203, Cl. 210-489.000.

Mirowski, Mieczyslaw: *See*—
Speicher, Vernon L.; and Bach, Stanley M., Jr., 4,603,705, Cl. 128-786.000.

Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., to United States of America, National Aeronautics and Space Administration. Apparatus for producing oxidation protection coatings for polymers. 4,604,181, Cl. 204-298.000.

Mishima, Fumiyuki: *See*—
Takenoya, Hideaki; and Mishima, Fumiyuki, 4,603,988, Cl. 400-649.000.

Mitel Corporation: *See*—
Barsellotti, John A., 4,604,741, Cl. 370-69.100.

Mitomi, Mitchio: *See*—
Sugiura, Satoshi; Mitomi, Mitchio; and Suzuki, Hirokazu, 4,604,580, Cl. 324-311.000.

Mitsubishi Chemical Industries Limited: *See*—
Kitsukawa, Tomohiko; Kusano, Hiroshi; Miyata, Eiji; and Sugawara, Toyokazu, 4,604,483, Cl. 562-443.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujii, Toshifumi, 4,604,656, Cl. 360-10.100.
Fuwa, Yasushi, 4,604,503, Cl. 200-11.0TC.
Imanishi, Kazuo, 4,604,705, Cl. 364-474.000.
Murasato, Shigeru; Nakanishi, Yuji; Fujiwara, Kenzou; Takeuchi, Norio; and Horita, Tsuyoshi, 4,604,541, Cl. 310-180.000.
Onishi, Ken; Ishida, Masayuki; Shirozu, Masakazu; Takedomi, Toshikatsu; Namekawa, Makoto; and Haikawa, Yukihiko, 4,604,747, Cl. 371-37.000.
Sakashita, Ryuji, 4,604,681, Cl. 364-183.000.
Yokota, Mitsuyoshi; Matsumoto, Akio; and Morishita, Mitsuharu, 4,604,565, Cl. 320-15.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Fujiwara, Haruyoshi; and Makino, Tetsuo, 4,604,164, Cl. 162-343.000.
Matsunata, Yuso, 4,603,487, Cl. 33-551.000.
Takahashi, Saburo, 4,603,893, Cl. 285-342.000.

Mitsubishi Petrochemical Company, Limited: *See*—
Sarumaru, Kohei; Shibano, Takeshi; Ishii, Yoichi; and Yamamoto, Etsuji, 4,604,370, Cl. 502-38.000.

Mitsubishi Rayon Company Ltd.: *See*—
Nakai, Yoshio; Yamauchi, Katsusuke; Kishimura, Masaaki; and Tateyama, Masamitsu, 4,604,416, Cl. 524-145.000.

Mitsuboshi Belting Ltd.: *See*—
Mashimo, Satoshi; Tanaka, Masayuki; Yamaguchi, Yoshio; and Kinoshita, Takashi, 4,604,081, Cl. 474-205.000.
Mizuno, Takahide, 4,604,080, Cl. 474-153.000.

Mitsuda, Yoshinobu; Inami, Tai; and Mori, Koji, to Pentel Kabushiki Kaisha. Ball-holder of a ball-point pen. 4,603,994, Cl. 401-209.000.

Mitsuhashi, Yoshinobu: *See*—
Fujii, Yoshimasa; Mitsuhashi, Yoshinobu; and Koike, Osamu, 4,603,941, Cl. 350-96.150.

Mitsuno, Tatsuyuki; Koyama, Teruhisa; and Ikezawa, Yuji, to Sumitomo Chemical Company, Limited. Polypropylene resin composition comprising talc having specified average diameter and particle size. 4,604,421, Cl. 524-449.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Sakagami, Seiji, 4,603,480, Cl. 33-125.00R.

Miyahara, Kousuke: *See*—
Kojima, Chiaki; Hasegawa, Kayoko; and Miyahara, Kousuke, 4,603,938, Cl. 350-3.720.

Miyake, Haruhisa; Suhara, Manabu; Sugaya, Yoshio; and Horie, Hirofumi, to Asahi Glass Company Ltd. Multi-layered diaphragm for electrolysis. 4,604,170, Cl. 204-98.000.

Miyaki, Masahiko: *See*—
Takemoto, Eiji; Miyaki, Masahiko; Norimatsu, Hideaki; Hobo, Nobuhito; Tsuzuki, Yoshihiko; and Konishi, Yoshimune, 4,603,669, Cl. 123-357.000.

Miyamoto, Junichi; and Saito, Shinji, to Tokyo Shibaura Denki Kabushiki Kaisha. Sense amplifier. 4,604,533, Cl. 307-530.000.

Miyamoto, Norioki: *See*—
Fujikura, Yoshiaki; Kajihara, Yasushi; Takaishi, Naotake; Inamoto, Yoshiaki; Kimura, Akio; Nakajima, Motoki; and Miyamoto, Norioki, 4,604,488, Cl. 568-820.000.

Miyamoto, Seigo: *See*—
Yanadori, Michio; and Miyamoto, Seigo, 4,604,223, Cl. 252-70.000.

Miyanaka, Masaki: *See*—
Hiroyasu, Minoru; Hashimoto, Hitoshi; Yamada, Susumu; Miyanaka, Masaki; and Koizumi, Hideharu, 4,603,456, Cl. 29-33.00P.

Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; Sugino, Eiichi; and Mutai, Masahiko, to Kabushiki Kaisha Yakult Honsha. Camptothecin derivatives and process for preparing same. 4,604,463, Cl. 544-125.000.

Miyata, Eiji: *See*—
Kitsukawa, Tomohiko; Kusano, Hiroshi; Miyata, Eiji; and Sugawara, Toyokazu, 4,604,483, Cl. 562-443.000.

Miyazaki, Takeshi; and Sugiyama, Kenji, to Toyoda Gosei Co., Ltd. Hose midway holder. 4,603,891, Cl. 285-205.000.

Miyoshi, Akito: *See*—
Okamoto, Miyoshi; Iijima, Hiromichi; and Miyoshi, Akito, 4,604,320, Cl. 428-290.000.

Mizoguchi, Takuo: *See*—
Aida, Akira; Ohno, Tetsu; Fukuda, Takashi; Aihara, Kenji; Mizoguchi, Takuo; Nishimura, Syozi; and Kajiyama, Katsuyoshi, 4,604,146, Cl. 148-12.00B.

Mizokawa, Sadao: *See*—
Hamada, Takuji; Takahashi, Masahiro; and Mizokawa, Sadao, 4,604,742, Cl. 370-89.000.

Mizoro, Tsuguo: *See*—
Oota, Koichi; and Mizoro, Tsuguo, 4,603,847, Cl. 271-10.000.

Mizuhara, Howard, to GTE Products Corporation. Ductile brazing alloy containing reactive metals and precious metals. 4,604,328, Cl. 428-606.000.

Mizuno, Takahide, to Mitsuboshi Belting Ltd. Toothed drive belt. 4,604,080, Cl. 474-153.000.

Mlinar, Mitchell J.; Louie, Kenneth; and Piotrowski, Wieslaw S., to TRW Inc. Microstrip circulator structure. 4,604,590, Cl. 333-1.100.

Mobil Oil Corporation: *See*—
Chen, Nai Y.; and Degnan, Thomas F., 4,604,261, Cl. 422-191.000.
Derbyshire, Francis J.; and Varghese, Philip, 4,604,189, Cl. 208-111.000.
Nahmias, A. Michael; and Park, Hee C., 4,604,324, Cl. 428-349.000.
Pistner, Timothy W., 4,604,084, Cl. 493-226.000.
Ruehle, William H., 4,604,734, Cl. 367-63.000.
Yan, Tsoung Y.; and Shu, Paul, 4,604,188, Cl. 208-106.000.

Mochida, Haruo; Shimizu, Keiichi; and Okuya, Shigetami, to Nissan Motor Co., Ltd.; and Kokusan Kinzoku Kogyo Kabushiki Kaisha. Magnetic door locking system. 4,603,563, Cl. 70-276.000.

Moeller, Charles P., to GA Technologies Inc. Cyclotron resonance maser system with microwave output window and coupling apparatus. 4,604,551, Cl. 315-4.000.

Mogami, Satoshi: *See*—
Uehara, Makoto; and Mogami, Satoshi, 4,603,950, Cl. 350-432.000.

Mohr, Dieter, to Hoechst Aktiengesellschaft. Process for the one-stage anodic oxidation of aluminum bases for offset printing plates and product thereof. 4,604,341, Cl. 430-278.000.

Mohri, Katsuo: *See*—
Itoh, Shigeyuki; Watatani, Yoshizumi; and Mohri, Katsuo, 4,604,659, Cl. 360-38.100.

Moir, Christopher I., to Micro Control Technology Limited. Position detector. 4,604,526, Cl. 250-561.000.

Molimard, Jean-Charles: *See*—
Biziere, Kathleen; Chambon, Jean-Pierre; and Molimard, Jean-Charles, 4,604,383, Cl. 514-63.000.

Molineux, Royston D. Ticket issuing machine with product dispenser. 4,603,792, Cl. 221-96.000.

Mollenhoff, David V.: *See*—
Middleton, Frederic H.; Mollenhoff, David V.; Taylor, Theodore L.; and Vaughn, Thomas N., 4,603,448, Cl. 15-22.00R.

Monarch Marking Systems, Inc.: *See*—
Pou, Frederick M., 4,603,629, Cl. 101-226.000.

Monreal, F. Javier. Kneeling or sitting sled. 4,603,870, Cl. 280-18.000.

Monsanto Company: *See*—
Gomez, I. Luis, 4,604,253, Cl. 264-211.000.
Van Eenam, Donald N., 4,604,163, Cl. 162-175.000.

Montesi, Edward N., to Siebe North, Inc. Yoke for the harness of a respirator. 4,603,692, Cl. 128-207.110.

Moore, Michael L.: *See*—
Callahan, James F.; Huffman, William F.; Moore, Michael L.; and Yim, Nelson C., 4,604,378, Cl. 514-11.000.

Moore, Norman. Method of producing side-pocket mandrels free of welds. 4,603,736, Cl. 166-117.500.

Moorehead, Eric L., to Union Oil Company of California. Oxidation catalyst. 4,604,371, Cl. 502-60.000.

Mora, Gilbert: *See*—
Roulet Dubonnet, Jean-Pierre; Boillot, Louis; and Mora, Gilbert, 4,604,507, Cl. 200-144.00R.

Moraillon, Philippe, to Generale des Engrais S.A. NP/NPK fertilizer granules comprised of ammonium phosphate. 4,604,126, Cl. 71-34.000.

Morell, Josef: *See*—
Rollenitz, Leopold; Schmidt, Harald; Freudenschuss, Otto; and Morell, Josef, 4,603,811, Cl. 239-90.000.

Mori, Kazuhiko: *See*—
Yamashita, Tsukasa; Inoue, Nobuhisa; Mori, Kazuhiko; and Matano, Masaharu, 4,604,707, Cl. 364-822.000.

Mori, Kazuo; and Isowa, Eiichi, to Isowa Industry Company, Ltd. Glue applicator for corrugator machines. 4,603,654, Cl. 118-202.000.

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Uehara, Makoto; and Mogami, Satoshi, 4,603,950, Cl. 350-432.000.

Nippon Oil Company Ltd.: *See—*
Yuasa, Hitoshi; Matsuno, Mitsuo; and Imai, Hirosuke, 4,604,490, Cl. 585-21.000.

Nippon Oil and Fats Co.: *See—*
Ohmura, Hiroshi; Oshibe, Yoshihiro; Nakayama, Masaharu; and Yamamoto, Takashi, 4,604,425, Cl. 525-88.000.

Nippon Paint Co., Ltd.: *See—*
Sakurai, Kiyomi; and Konishi, Katsuzi, 4,604,343, Cl. 430-281.000.

Nippon Petrochemicals Co., Ltd.: *See—*
Okahara, Mitsuo; and Ikeda, Isao, 4,604,321, Cl. 428-319.900.

Nippon Polyurethane Industry Co., Ltd.: *See—*
Shindo, Masanori; Aoki, Yusuke; Kataoka, Yosizumi; Enomoto, Susumu; and Nakamura, Minoru, 4,604,418, Cl. 524-296.000.

Nippon Soken, Inc.: *See—*
Yamanoue, Kouichi; Kitagawa, Junji; Akita, Shigeyuki; and Kuno, Akira, 4,603,581, Cl. 73-304.00C.
Yoshinaga, Toru; Igashira, Toshihiko; Sakakibara, Yasuyuki; and Natsuyama, Yukihiro, 4,603,671, Cl. 123-467.000.

Nippon Steel Corporation: *See—*
Watanabe, Kazuo; Seki, Hiromi; Yamada, Kenji; and Tsuyama, Yoshito, 4,603,806, Cl. 228-152.000.

Nippon Zeon Co., Ltd.: *See—*
Nishina, Masaaki; Imaizumi, Shiro; and Ozaki, Osamu, 4,604,454, Cl. 528-491.000.

Nippon Zeon Co., Ltd: *See—*
Joh, Yasushi; Nagase, Toshio; and Kaneko, Noriaki, 4,604,412, Cl. 523-112.000.

Nippondenso Co., Ltd.: *See—*
Otsuki, Hiromi; Matsuura, Ryoichi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,603,920, Cl. 303-10.000.
Takemoto, Eiji; Miyaki, Masahiko; Norimatsu, Hideaki; Hobo, Nobuhito; Tsuzuki, Yoshihiko; and Konishi, Yoshimune, 4,603,669, Cl. 123-357.000.
Yamanoue, Kouichi; Kitagawa, Junji; Akita, Shigeyuki; and Kuno, Akira, 4,603,581, Cl. 73-304.00C.

Niriki, Takashi: *See—*
Suemitsu, Takashi; and Niriki, Takashi, 4,603,473, Cl. 29-578.000.

Nishida, Mamoru: *See—*
Kawaguchi, Hiroshi; Sasaki, Hirofumi; Nishida, Mamoru; and Harada, Shinichi, 4,603,729, Cl. 164-442.000.

Nishikawa, Masao; Sakai, Shinzo; Sato, Yoichi; and Fukuda, Yukihiro, to Honda Giken Kogyo Kabushiki Kaisha. Direct-coupling controller for a transmission having delay means for temporarily releasing the clutch during speed change. 4,603,601, Cl. 74-731.000.

Nishikawa, Masao; Sato, Yoichi; and Fukuda, Yukihiro, to Honda Giken Kogyo K.K. Creep-inhibiting device for an automotive vehicle equipped with an automatic transmission. 4,603,604, Cl. 74-869.000.

Nishimura, Syozi: *See—*
Aida, Akira; Ohno, Tetsu; Fukuda, Takashi; Aihara, Kenji; Mizoguchi, Takuo; Nishimura, Syozi; and Kajiyama, Katsuyoshi, 4,604,146, Cl. 148-12.00B.

Nishina, Masaaki; Imaizumi, Shiro; and Ozaki, Osamu, to Nippon Zeon Co., Ltd. Method of recovering vinyl chloride resin. 4,604,454, Cl. 528-491.000.

Nishino, Yoshinori: *See—*
Yamamoto, Masahiko; Nishino, Yoshinori; Uda, Tadayoshi; Sonoda, Yoshiteru; and Suyama, Toshio, 4,604,254, Cl. 264-254.000.

Nishiyama, Tadashi: *See—*
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,604,411, Cl. 522-14.000.

Nishizawa, Minoru, to Gakei Electric Works Co., Ltd. Apparatus for positioning and locating a baffle plate in a crucible. 4,604,262, Cl. 422-310.000.

Nissan Chemical Industries, Ltd.: *See—*
Takakura, Makoto; Kondo, Susumu; and Nogami, Tatsuya, 4,604,303, Cl. 427-229.000.

Nissan Motor Co., Ltd.: *See—*
Kondo, Takumi, 4,603,462, Cl. 29-281.100.
Matsuoka, Hideoki, 4,603,599, Cl. 74-492.000.
Mochida, Haruo; Shimizu, Keiichi; and Okuya, Shigetami, 4,603,563, Cl. 70-276.000.
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,604,611, Cl. 340-576.000.
Shinzawa, Motohiro, 4,603,550, Cl. 60-274.000.
Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, 4,603,602, Cl. 74-866.000.
Tsuji, Shinsaku; Kimura, Toshimitsu; Asano, Yasushi; and Suzuki, Yasuhito, 4,603,598, Cl. 74-473.00P.

Nisshin Engineering Co., Ltd.: *See—*
Yamada, Yukiyoshi; Doi, Shin; and Yasuguchi, Masayuki, 4,604,192, Cl. 209-144.000.

Nisshin Flour Milling Co., Ltd.: *See—*
Yamada, Yukiyoshi; Doi, Shin; and Yasuguchi, Masayuki, 4,604,192, Cl. 209-144.000.

Nitto Boseki Co., Ltd.: *See—*
Harada, Susumu; Shimizu, Kiyoshi; and Ujiie, Masayuki, 4,604,451, Cl. 525-328.200.

Nitto Kohki Co., Ltd.: *See—*
Shoji, Mitihiro; and Mikiya, Toshio, 4,604,006, Cl. 408-76.000.

Noble, Roger K.: *See—*
Schwartz, Robert E.; and Noble, Roger K., 4,604,048, Cl. 431-8.000.

Noda, Masahiro: *See—*
Udagawa, Masakazu; Saito, Masaaki; Segawa, Shingo; and Noda, Masahiro, 4,603,898, Cl. 296-91.000.

Noda, Yasushi: *See*—
Kitahara, Toshihiro; and Noda, Yasushi, 4,604,666, Cl. 360-99.000.
Nogami, Junzo: *See*—
Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,604,457, Cl. 540-223.000.
Nogami, Tatsuya: *See*—
Takakura, Makoto; Kondo, Susumu; and Nogami, Tatsuya, 4,604,303, Cl. 427-229.000.
Nokata, Kenichiro: *See*—
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; Sugino, Eiichi; and Mutai, Masahiko, 4,604,463, Cl. 544-125.000.
Noll, Klaus: *See*—
Reiffen, Manfred; Noll, Klaus; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,604,389, Cl. 514-213.000.
Nolph, Karl D.: *See*—
Twardowski, Zbylut J.; and Nolph, Karl D., 4,604,379, Cl. 514-21.000.
Nomura, Yoshihisa: *See*—
Otsuki, Hiromi; Matsuura, Ryoichi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,603,920, Cl. 303-10.000.
Nonaka, Susumu: *See*—
Kuranishi, Masaaki; Nonaka, Susumu; Furukawa, Koichi; and Siozaki, Fumio, 4,603,987, Cl. 400-639.100.
Norand Corporation: *See*—
Chadima, George E., Jr.; and Kubler, Joseph J., 4,604,693, Cl. 364-200.000.
Norimatsu, Hideaki: *See*—
Takemoto, Eiji; Miyaki, Masahiko; Norimatsu, Hideaki; Hobo, Nobuhito; Tsuzuki, Yoshihiko; and Konishi, Yoshimune, 4,603,669, Cl. 123-357.000.
Norman, Jacob J., to American Hospital Supply Corporation. Blood pressure transducer tester. 4,603,574, Cl. 73-4.00R.
Norman, Theodore A.; and Norman, Van B., to Simulated Designs, Ltd. Computer simulation system. 4,604,718, Cl. 364-578.000.
Norman, Van B.: *See*—
Norman, Theodore A.; and Norman, Van B., 4,604,718, Cl. 364-578.000.
Norris, Peter E.: *See*—
Armiento, Craig A.; and Norris, Peter E., 4,603,469, Cl. 29-571.000.
North American Philips Corporation: *See*—
Alexandru, Radu, 4,604,743, Cl. 370-85.000.
Northern Telecom Limited: *See*—
Bell, John M.; and Schmidt, Peter J., 4,604,497, Cl. 174-110.00F.
Fitzpatrick, Michael H., 4,603,929, Cl. 339-17.00C.
Norton Christensen, Inc.: *See*—
Davis, J. Stanley; and Radford, Steven R., 4,603,749, Cl. 175-250.000.
Norton, John H. R.; and Rebello, Peter R., to AECI Limited. Fuels. 4,603,662, Cl. 123-1.00A.
Norton, Peter. Dual voltage power supply system for vehicles. 4,604,528, Cl. 307-10.00R.
Nottbohm, Friedrich. Instrument for indirect treatment with a hot air flow and moxa smoke. 4,604,088, Cl. 604-24.000.
Novikov, Vladimir V.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.
Novo Industri A/S: *See*—
Outtrup, Helle, 4,604,355, Cl. 435-95.000.
Nozaki, Toshiyuki: *See*—
Hirukawa, Yohichi; Nozaki, Toshiyuki; and Hosokawa, Naokichi, 4,604,180, Cl. 204-298.000.
Numata, Toshi: *See*—
Senda, Atsuo; Numata, Toshi; Nakagawa, Takuji; and Ogiso, Yoshifumi, 4,604,676, Cl. 361-309.000.
Obara, Hideo: *See*—
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,604,611, Cl. 340-576.000.
Oberkirch, Wolfgang; de Montigny, Armand; and Botsch, Hansjurgen, to Bayer Aktiengesellschaft. Process and means for preventing blockages of crude oil deposits by the formation of emulsion due to deposits of asphalt. 4,603,738, Cl. 166-275.000.
Oblas, Daniel W.; and Su, Sophia R., to GTE Laboratories Incorporated. Intercalation of small graphite flakes with a metal halide. 4,604,276, Cl. 423-449.000.
O'Brien, Barry H.: *See*—
Park, Jin Y.; O'Brien, Barry H.; and Lee, Woo G., 4,604,362, Cl. 436-34.000.
O'Brien, Terry R., to Gould Inc. Electric plug fuse with corrugated element. 4,604,601, Cl. 337-261.000.
Occidental Chemical Corporation: *See*—
Tari, Karl; Bommaraju, Tilak V.; and Rader, Charles G., 4,604,301, Cl. 427-123.000.
Thorpe, Donald H.; and Knipple, Raymond P., 4,604,436, Cl. 525-504.000.
Warszawski, Bernard; Fauvel, Pierre; and Dupre , Sylvain, 4,604,332, Cl. 429-38.000.
O'Connor, Lawrence J. Package of tape. 4,603,817, Cl. 242-1.000.
Oda, Yukio: *See*—
Suzuki, Ikuo; and Oda, Yukio, 4,603,514, Cl. 51-281.00C.
Odaka, Kentaro: *See*—
Fukami, Tadashi; and Odaka, Kentaro, 4,604,657, Cl. 360-32.000.
O'Donnell, John P.: *See*—
Kam, Sheung-tsam; Erhardt, Paul W.; Borgman, Robert J.; and O'Donnell, John P., 4,604,481, Cl. 560-39.000.
Odorcic, Vlado: *See*—
Baker, Robert W.; Donely, Dean; and Odorcic, Vlado, 4,604,610, Cl. 340-566.000.
Ogata, Masahiro: *See*—
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, 4,604,749, Cl. 371-38.000.
Ogden, Ralph. Barbeque grill with paper start facility. 4,603,679, Cl. 126-25.00B.
Ogiso, Yoshifumi: *See*—
Senda, Atsuo; Numata, Toshi; Nakagawa, Takuji; and Ogiso, Yoshifumi, 4,604,676, Cl. 361-309.000.
Oguni, Kensaku: *See*—
Suefuji, Kazutaka; Yasuda, Hiromu; Hayashi, Masakatsu; Arata, Tetsuya; Oguni, Kensaku; Kuroda, Shigeaki; Atsumi, Akira; Ishibane, Kyuhei; Terada, Hirokiyo; Senshu, Takao; and Kogure, Hiroshi, 4,603,556, Cl. 62-180.000.
O'Har, George M.: *See*—
Widen, Melinda A.; Bradley, John J.; and O'Har, George M., 4,604,695, Cl. 364-200.000.
Ohi, Nobukazu: *See*—
Kamohara, Hiroshi; Hayashi, Shohei; and Ohi, Nobukazu, 4,604,142, Cl. 106-38.510.
Ohkubo, Nobukuni: *See*—
Moribe, Yoshihiro; Ohkubo, Nobukuni; Takahashi, Mikio; and Nakagoshi, Kazuo, 4,604,663, Cl. 360-73.000.
Ohmori, Akira; Takaki, Shoji; and Kitahara, Takahiro, to Daikin Kogyo Co., Ltd. Processes for producing α-fluoroacrylic acid esters and α-fluoroacrylic acid fluoride. 4,604,482, Cl. 560-213.000.
Ohmori, Takashi: *See*—
Ishibashi, Yoji; Sato, Isao; Kato, Fumio; Ohmori, Takashi; and Hayashi, Noriyuki, 4,603,548, Cl. 60-39.060.
Ohmura, Hiroshi; Oshibe, Yoshihiro; Nakayama, Masaharu; and Yamamoto, Takashi, to Nippon Oil and Fats Co. Method for modifying the surface of polymer materials. 4,604,425, Cl. 525-88.000.
Ohno, Tetsu: *See*—
Aida, Akira; Ohno, Tetsu; Fukuda, Takashi; Aihara, Kenji; Mizoguchi, Takuo; Nishimura, Syozi; and Kajiyama, Katsuyoshi, 4,604,146, Cl. 148-12.00B.
Oho, Shigeru; and Hirayama, Takeshi, to Hitachi, Ltd. Information transmission system. 4,604,620, Cl. 340-825.520.
Ohta, Norio: *See*—
Matsumura, Hiroyoshi; Katsuyama, Toshio; Ohta, Norio; Suganuma, Tsuneo; Nagatsuma, Kazuyuki; and Sugita, Yutaka, 4,604,577, Cl. 324-244.000.
Ohtaka, Satoshi: *See*—
Suzukawa, Yuichi; Kobayashi, Waichi; and Ohtaka, Satoshi, 4,604,143, Cl. 106-89.000.
Oi, Naobumi; Doi, Tadashi; and Nagase, Masayuki, to Sumitomo Chemical Co., Ltd. Packing materials for chromatographic use and a method for analysis of an enantiomer mixture using the same. 4,604,207, Cl. 210-635.000.
Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic recording tape cassette. 4,604,671, Cl. 360-132.000.
Oka, Hiroyuki: *See*—
Otsuki, Hiromi; Matsuura, Ryoichi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,603,920, Cl. 303-10.000.
Okahara, Mitsuo; and Ikeda, Isao, to Nippon Petrochemicals Co., Ltd. Mercury adsorbing agent. 4,604,321, Cl. 428-319.900.
Okajima, Yoshinori, to Fujitsu Limited. Semiconductor memory device. 4,604,728, Cl. 365-189.000.
Okamoto, Miyoshi; Iijima, Hiromichi; and Miyoshi, Akito, to Toray Industries, Inc. Ultrafine sheath-core composite fibers and composite sheets made thereof. 4,604,320, Cl. 428-290.000.
Oken Seiko Co., Ltd.: *See*—
Fukami, Tadashi, 4,604,540, Cl. 310-154.000.
Okoshi, Takanori, to Sumitomo Electric Industries, Ltd. Structure of an optical fiber. 4,603,943, Cl. 350-96.300.
Okubo, Yasuto: *See*—
Seno, Taiko; Okubo, Yasuto; Kawamura, Masao; Akutsu, Seiichi; and Fukuda, Hirosuke, 4,604,349, Cl. 435-15.000.
Okuya, Shigetami: *See*—
Mochida, Haruo; Shimizu, Keiichi; and Okuya, Shigetami, 4,603,563, Cl. 70-276.000.
Olivotto S.p.A.: *See*—
Olivotto, Vanfrido, 4,604,149, Cl. 148-153.000.
Olivotto, Vanfrido, to Olivotto S.p.A. Process for hardening elongate metal elements. 4,604,149, Cl. 148-153.000.
Olofsson, Stig E. E. Thread reel. 4,603,820, Cl. 242-118.400.
Olsen, Randall B., to GA Technologies Inc. Graphite fiber thermal radiator. 4,603,731, Cl. 165-41.000.
Olsson, Lennart, to Frigoscandia Contracting AB. Conveyor belt. 4,603,776, Cl. 198-778.000.
Olympus Optical Co., Ltd.: *See*—
Imai, Toshihiro, 4,603,948, Cl. 350-426.000.
Mimura, Yoshiyuki; and Toda, Akitoshi, 4,604,337, Cl. 430-46.000.
Omega Electronics S.A.: *See*—
Suter, Max, 4,604,621, Cl. 340-825.690.

Omron Tateisi Electronics Co.: *See*—
Yamashita, Tsukasa; Inoue, Nobuhisa; Mori, Kazuhiko; and Matano, Masaharu, 4,604,707, Cl. 364-822.000.

Onder, Kemal: *See*—
Dai, Shenghong A.; Grossman, Steven J.; and Onder, Kemal, 4,604,450, Cl. 528-322.000.

O'Neill, Sean P.; and Wu, Joseph, to Electro-Nucleonics, Inc. Immunoprecipitation assay. 4,604,365, Cl. 436-528.000.

Onishi, Junko, administratrix: *See*—
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, 4,604,749, Cl. 371-38.000.

Onishi, Ken; Ishida, Masayuki; Shirozu, Masakazu; Takedomi, Toshikatsu; Namekawa, Makoto; and Haikawa, Yukihiko, to Mitsubishi Denki Kabushiki Kaisha; Akai Electric Company Limited; and Alpine Electronics, Inc. Error correcting and controlling system. 4,604,747, Cl. 371-37.000.

Onishi, Yoshiaki, deceased: *See*—
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, 4,604,749, Cl. 371-38.000.

Ono, Taizo: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,604,385, Cl. 514-183.000.

Onorati, Frank V., to Xerox Corporation. Drive system. 4,603,597, Cl. 74-434.000.

Oota, Koichi; and Mizoro, Tsuguo, to Glory Kogyo Kabushiki Kaisha. Bank note processing machine equipped with a cassette for accommodating bank notes. 4,603,847, Cl. 271-10.000.

Oppenheimer, Alfred: *See*—
Glass, Michael; Hoholick, Joseph; Oppenheimer, Alfred; and Dombroski, Amy, 4,604,287, Cl. 426-5.000.

Orain, Michel A., to Glaenzer Spicer. Constant-speed tripod joint having an axial retention. 4,604,077, Cl. 464-111.000.

Orlandi, Daniel A.: *See*—
Glass, Michael; Corsello, Vincent; Orlandi, Daniel A.; and Guzowski, Anthony, 4,604,288, Cl. 426-5.000.

Orlando, John J.: *See*—
Mehltretter, James C.; Woodard, Winfred L., III; Orlando, John J.; and Goodrich, Charles B., 4,603,814, Cl. 241-30.000.

Orlowski, Ronald C.; and Seyler, Jay K. Calcitonin analogs. 4,604,236, Cl. 530-307.000.

Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., to Armour Pharmaceutical Company. Des-21-threonine-calcitonin. 4,604,237, Cl. 530-307.000.

Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., to Armour Pharmaceutical Company. Analogs of calcitonin. 4,604,238, Cl. 530-307.000.

Oronzio de Nora Impianti Elecrtrochimici, S.p.A.: *See*—
Nidola, Antonio; and de Nora, Oronzio, 4,604,173, Cl. 204-105.00R.

Orrhammar, Hans, to Agence Spatiale Europeenne. Apparatus for controlling reproduction of text characters whose form depends on adjacency of other characters. 4,604,712, Cl. 364-900.000.

Orrville Products, Inc.: *See*—
Craver, Richard D., 4,603,683, Cl. 126-138.000.

Ortendahl, Douglas A.: *See*—
Cannon, Clifford R.; and Ortendahl, Douglas A., 4,604,579, Cl. 324-309.000.

Ortwine, Daniel F.: *See*—
Elslager, Edward F.; Werbel, Leslie M.; Ortwine, Daniel F.; Worth, Donald F.; Showalter, Howard D. H.; Capps, David B.; Berman, Ellen M.; Gregor, Vlad E.; and Sercel, Anthony D., 4,604,390, Cl. 514-222.000.

Osberghaus, Rainer; Scheller, Bernfrid; Schunter, Roland; Kresse, Franz; and Schell, Helmut, to Henkel Kommanditgesellschaft auf Aktien. Frame for a floor wiper. 4,603,450, Cl. 15-147.00A.

Osenkowski, Joseph M., to General Motors Corporation. Lock and handle module for vehicle door. 4,603,894, Cl. 292-216.000.

Oshibe, Yoshihiro: *See*—
Ohmura, Hiroshi; Oshibe, Yoshihiro; Nakayama, Masaharu; and Yamamoto, Takashi, 4,604,425, Cl. 525-88.000.

Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, to Bridgestone Tire Company; and Japan Synthetic Rubber Co., Ltd. Tire tread comprised of branched styrene-butadiene copolymers. 4,603,722, Cl. 152-209.00R.

Oshio, Hiromichi: *See*—
Mori, Kenji; Takematsu, Tetsuo; Sakakibara, Masayuki; and Oshio, Hiromichi, 4,604,240, Cl. 540-114.000.

Ostby, Lyle D., to Kearney & Trecker Corporation. Leveling apparatus. 4,603,485, Cl. 33-367.000.

Otsuka Kagaku Kabushiki Kaisha: *See*—
Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,604,457, Cl. 540-223.000.

Otsuki, Hiromi; Matsuura, Ryoichi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, to Nippondenso Co., Ltd. Hydraulic pressure control device for use in vehicle anti-skid braking system. 4,603,920, Cl. 303-10.000.

Outboard Marine Corporation: *See*—
Guinn, Douglas B., 4,604,068, Cl. 440-76.000.

Outtrup, Helle, to Novo Industri A/S. Maltogenic amylase enzyme, preparation and use thereof. 4,604,355, Cl. 435-95.000.

Owens-Corning Fiberglas Corporation: *See*—
Berg, James I., 4,603,980, Cl. 374-179.000.
Pollet, Jean-Claude; Armstrong, Gordon P.; and Flautt, Martin C., 4,604,325, Cl. 428-391.000.

Owens-Illinois, Inc.: *See*—
Fosnaught, Harold R., 4,604,154, Cl. 156-264.000.

Oy Wartsila AB: *See*—
Huisma, Camiel, 4,603,709, Cl. 137-205.000.

Ozaki, Osamu: *See*—
Nishina, Masaaki; Imaizumi, Shiro; and Ozaki, Osamu, 4,604,454, Cl. 528-491.000.

Ozaki, Shiyozi: *See*—
Horie, Tuneo; Ozaki, Shiyozi; and Takeuti, Takikazu, 4,604,660, Cl. 360-45.000.

Ozawa, Kunihiko. Method of making lock nuts. 4,603,446, Cl. 10-86.00A.

Pace, Vincent C., to Formost Packaging Machines, Inc. Method for making a bag with a bag mouth closure. 4,603,537, Cl. 53-415.000.

Paciorek, Peter M., to General Dynamics Corporation. Detachable hinge with conveniently releasable hinge flaps. 4,603,452, Cl. 16-262.000.

Painton, Anthony R.: *See*—
Clutterbuck, Richard C. D.; and Painton, Anthony R., 4,604,536, Cl. 307-603.000.

Pako Corporation: *See*—
Baker, Richard W., 4,603,956, Cl. 354-298.000.

Palkin, Leonid N.: *See*—
Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., 4,604,724, Cl. 364-478.000.

Pall Corporation: *See*—
Koslow, Evan E., 4,604,109, Cl. 55-52.000.

Pallini, Joseph W., Jr.; and Rohweller, David J., to Vetco Offshore, Inc. Snap type pipe connector. 4,603,886, Cl. 285-24.000.

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Frazer, Stephen O.; and Riddiford, Martin P., 4,604,065, Cl. 434-331.000.

Ridgway, Stuart L., to R & D Associates. Ballistic cold water pipe. 4,603,553, Cl. 60-641.700.

Rieter Machine Works, Ltd.: *See*—
Luz, Rudolf; and Gartner, Gunter, 4,603,818, Cl. 242-35.50A.

Riker Laboratories, Inc.: *See*—
Wade, James J., 4,604,466, Cl. 544-330.000.

Rimbey, Ronald P.: *See*—
Espinoza, John A.; Konchan, Jeffrey L.; and Rimbey, Ronald P., 4,603,877, Cl. 280-807.000.

Rinaldo, Gary M. J.: *See*—
Spanier, Henry C.; Spiel, Albert; and Rinaldo, Gary M. J., 4,604,289, Cl. 426-19.000.

Rinderle, Heinz, to Telefunken Electronic GmbH. Amplifier with current mirror circuit for controlling amplification temperature dependency. 4,604,586, Cl. 330-288.000.

Ringer, Richard M.: *See*—
Creighton, Thomas C.; Dorsey, William C.; Lewicki, Walter J., Jr.; Long, Harry F.; and Ringer, Richard M., 4,604,312, Cl. 428-137.000.

Ripani, Sergio; and Serafini, Giulio, to Carle & Montanari S.p.A. Controlled operation chocolate refiner. 4,603,815, Cl. 241-36.000.

Rippelmeyer, Dennis M.: *See*—
Mueller, Carl J.; Brown, Bernard T.; Rippelmeyer, Dennis M.; and Haefner, John S., 4,604,046, Cl. 431-2.000.

Risdon Corporation: *See*—
Ackerman, Walter T.; and Klimeck, Edward F., 4,603,989, Cl. 401-78.000.

Ritter, Joachim: *See*—
Doppling, Horst; Hertrich, Steffen; Poschl, Walter; Ritter, Joachim; and Sill, Karl, 4,603,923, Cl. 384-7.000.

Robert Bosch GmbH: *See*—
Bertsch, Richard; Gunther, Dieter; Schnurle, Hans; and Steinbrenner, Ulrich, 4,603,670, Cl. 123-440.000.
Bogner, Karl-Heinz; and Bolenz, Klaus, 4,604,597, Cl. 335-127.000.
Grauel, Ingolf; Kulke, Gunter; Muller, Egbert; and Stumpe, Werner, 4,603,919, Cl. 303-6.00R.
Grunwald, Werner; Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; and Schmid, Kurt, 4,603,667, Cl. 123-297.000.
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,603,675, Cl. 123-478.000.
Leiber, Heinz; and Bertling, Hannes, 4,603,918, Cl. 303-6.00R.
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,604,598, Cl. 335-128.000.

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Roberts, James R., to A. O. Smith Harvestore Products, Inc. Submersible pump having frangible drive connection. 4,604,035, Cl. 417-319.000.

Roberts, Jimmy C. Method and apparatus for converting line trimmer into a trolling motor. 4,604,067, Cl. 440-49.000.

Roberts, Melvin F., to Bloomfield Industries, Inc. Beverage-making device. 4,603,621, Cl. 99-307.000.

Roberts, William P.; and Schulz, Leslie A., to W. R. Grace & Co. Method of forming electrically conductive polymer blends. 4,604,427, Cl. 525-185.000.

Robertshaw Controls Company: *See*—
Katchka, Jay R.; and Schultz, Gilbert, 4,604,049, Cl. 431-80.000.

Robinson, Lonnie: *See*—
Fox, David H.; and Robinson, Lonnie, 4,604,546, Cl. 313-272.000.

Robinson, Tibor: *See*—
Kissling, Bruno; and Robinson, Tibor, 4,604,101, Cl. 8-551.000.

Robson, Joseph R.: *See*—
Reiter, Eli; and Robson, Joseph R., 4,603,542, Cl. 53-585.000.

Roch, Roger: *See*—
Barny, Jean J.; and Roch, Roger, 4,604,083, Cl. 493-34.000.

Rockwell International Corporation: *See*—
Fadner, Thomas A., 4,603,634, Cl. 101-426.000.
Hallford, Ben R., 4,604,585, Cl. 330-286.000.
Liggett, John V., 4,603,921, Cl. 303-6.00C.
Stacher, George W., 4,603,808, Cl. 228-265.000.

Rogers Corporation: *See*—
Gardner, John R., 4,603,927, Cl. 339-17.00C.

Rogers, William O., to Motorola, Inc. Method for enhancing the solderability of nickel layers. 4,603,805, Cl. 228-123.000.

Rohweller, David J.: *See*—
Pallini, Joseph W., Jr.; and Rohweller, David J., 4,603,886, Cl. 285-24.000.

Rolando, Giovanni; and Manunta, Giorgio, to Carello Industriale, S.p.A. Method of assembling a motor vehicle headlight, and headlight produced using such a method. 4,604,679, Cl. 362-277.000.

Rollenitz, Leopold; Schmidt, Harald; Freudenschuss, Otto; and Morell, Josef, to Steyr-Daimler-Puch AG. Injection unit associated with each cylinder of a multicylinder diesel engine. 4,603,811, Cl. 239-90.000.

Rolls-Royce Limited: *See*—
Collins, Brian J., 4,603,546, Cl. 60-39.020.
Moss, Roger W.; Coney, Michael H.; and Richardson, David A., 4,604,031, Cl. 416-97.00R.

Romanovsky, Anatoly G.: *See*—
Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., 4,604,724, Cl. 364-478.000.

Roming, Helmut. Massage apparatus. 4,603,688, Cl. 128-37.000.

Ronald A. Smith & Associates: *See*—
Smith, Ronald A.; Jackson, James M.; Lehfeldt, Carl L.; Cygnarowicz, Leonard P.; Moshfegh, Khosro; Blanchard, Kenneth L.; and Nelson, Kenneth J., 4,603,567, Cl. 72-8.000.

Roncucci, Gabrio: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Maggi, Carlo Alberto; Roncucci, Gabrio; and Meli, Alberto, 4,604,392, Cl. 514-227.000.

Rooker, Mitchel L.: *See*—
Lowrie, Neely E.; and Rooker, Mitchel L., 4,604,196, Cl. 210-136.000.

Rootsaert, Walter J. M.; and van der Loo, Carolus H., to Shell Oil Company. Thickened aqueous hydrochloric acid composition for descaling, or treatment of subterranean formations. 4,604,233, Cl. 252-558.000.

Rosebrock, Henning: *See*—
Schott, Eberhard P.; Fischer, Volker; Jung, Johann; and Rosebrock, Henning, 4,604,129, Cl. 71-76.000.

Rosenquist, Niles R., to General Electric Company. Aromatic polycarbonate crosslinked with aromatic bis cyclic carbonate. 4,604,434, Cl. 525-462.000.

Roskos, Kenneth B.: *See*—
Kay, Edward L.; and Roskos, Kenneth B., 4,604,445, Cl. 528-64.000.

Ross, Dennis M.: *See*—
Amezcua, Robert; Clements, Silous F.; Coenen, John S.; DaFoe, Ralph H.; Day, Michael N.; Ross, Dennis M.; and Simpson, Richard O., 4,604,710, Cl. 364-900.000.

Ross, Mitchell S.: *See*—
McKee, Bruce C.; and Ross, Mitchell S., 4,604,070, Cl. 441-70.000.

Ross, Oakley G.: *See*—
Chang, Yu-Wen; Kan, Phillip T.; and Ross, Oakley G., 4,603,942, Cl. 350-96.240.

Rossfelder, Andre M.; and Jung, Peter A., to Geomarex. High frequency vibratory systems for earth boring. 4,603,748, Cl. 175-19.000.

Rothe, Anselm; Knappe, Wolfgang-Reinhold; and Trasch, Heinz-Friedrich, to Boehringer Mannheim GmbH. Test strips. 4,604,264, Cl. 422-56.000.

Rouaud, Christian: *See*—
Abbes, Claude; De Villepoix, Raymond; and Rouaud, Christian, 4,603,892, Cl. 285-336.000.

Roulet Dubonnet, Jean-Pierre; Boillot, Louis; and Mora, Gilbert, to Gerin, Merlin. Miniature circuit breaker with improved insulation level. 4,604,507, Cl. 200-144.00R.

Rousseau, Carl H. Apparatus for obtaining improved dental castings. 4,603,728, Cl. 164-237.000.

Roy, Asit: *See*—
Chu, Chaokang; Fiore, Joseph V.; Knight, Rodney A.; Marinaccio, Paul J.; and Roy, Asit, 4,604,208, Cl. 210-636.000.

Rubens, Louis C., to Dow Chemical Company, The. Better foamable styrene and other olefin polymer compositions. 4,604,426, Cl. 525-123.000.

Rudman, Leonid I.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Ruehle, William H., to Mobil Oil Corporation. Seismic exploration in areas where p waves are converted to s waves. 4,604,734, Cl. 367-63.000.

Ruffman, Samuel H. Anti-theft device for appliances with electrical AC power cords. 4,603,931, Cl. 339-37.000.

Ruhle, Wolfgang; and Weyrich, Claus, to Siemens Aktiengesellschaft. Light-emitting diode suitable as a pressure sensor. 4,604,637, Cl. 357-17.000.

Rungger, Helmut; Fuchs, Erwin; and Knoll, Johann, to Dr. Techn. Ernst Linsinger & Co. GmbH. Method and apparatus for edge-planing sheet metal. 4,604,011, Cl. 409-138.000.

Russ, Norman. Portable selector drill. 4,604,005, Cl. 408-35.000.

Russ, Roger R.; and Berggreen, Arthur C., to Advanced Computer Communications. Communication controller using multiported random access memory. 4,604,683, Cl. 364-200.000.

Russell, Brian. Portable exercising device. 4,603,851, Cl. 272-96.000.

Russell, Monte E.: *See*—
Hall, David R.; Russell, Monte E.; and Hall, H. Tracy, Jr., 4,604,106, Cl. 51-293.000.

Rusz, Tibor. Pulmonary ventilator-bellows-assembly kit. 4,603,691, Cl. 128-205.150.

Rutkowski, Stephen F.: *See*—
Siemers, Paul A.; Jackson, Melvin R.; and Rutkowski, Stephen F., 4,603,568, Cl. 72-47.000.

Ryan, Delvin R., Jr., to SEVKO, Inc. Shelf assembly. 4,603,781, Cl. 211-90.000.

Ryan, Philip M.: *See*—
Aichelmann, Frederick J., Jr.; and Ryan, Philip M., 4,604,751, Cl. 371-38.000.

Ryco Graphic Manufacturing, Inc.: *See*—
Switall, Thomas G., 4,603,655, Cl. 118-302.000.

S.N.E.C.M.A.: *See*—
Surdi, Jean M., 4,604,033, Cl. 416-220.00R.
Saad, Saad S.; and Knop, Charles M., to Andrew Corporation. Flared microwave feed horns and waveguide transitions. 4,604,627, Cl. 343-786.000.
Saburo, Yoinara: *See*—
Kazuo, Ozawa; and Saburo, Yoinara, 4,603,684, Cl. 126-299.00R.
SACE S.p.A. Costruzioni Elettromeccaniche: *See*—
Talpo, Gianpietro, 4,604,508, Cl. 200-148.00R.
Saeki, Takashi: *See*—
Akiba, Osamu; Suzuki, Yoshiharu; Terada, Motoharu; and Saeki, Takashi, 4,604,618, Cl. 340-825.060.
Safonov, Anatoly V.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.
Sahli, Ali: *See*—
Labeeuw, Bernard; and Sahli, Ali, 4,604,387, Cl. 514-206.000.
St. Pierre, Raymond M., to Mattel, Inc. Toy stove with simulated timer. 4,604,076, Cl. 446-418.000.
Saito, Masaaki: *See*—
Udagawa, Masakazu; Saito, Masaaki; Segawa, Shingo; and Noda, Masahiro, 4,603,898, Cl. 296-91.000.
Saito, Norio: *See*—
Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,604,457, Cl. 540-223.000.
Saito, Shinji: *See*—
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Saito, Takao: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,604,411, Cl. 522-14.000.
Saito, Tsunenari; Murata, Akio; and Sakai, Koichi, to Sony Corporation. Deflection system for a two electron beam cathode ray tube. 4,604,547, Cl. 313-413.000.
Sakagami, Seiji, to Mitutoyo Mfg. Co., Ltd. Linear scale type displacement measuring instrument. 4,603,480, Cl. 33-125.00R.
Sakai, Kikuo: *See*—
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, 4,604,749, Cl. 371-38.000.
Sakai, Koichi: *See*—
Saito, Tsunenari; Murata, Akio; and Sakai, Koichi, 4,604,547, Cl. 313-413.000.
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Sakakibara, Masayuki: *See*—
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Sakakibara, Yasuyuki: *See*—
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Sakamoto, Tatsuji: *See*—
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Sakashita, Ryuji, to Mitsubishi Denki Kabushiki Kaisha. Feedback control method and system having variable deadband. 4,604,681, Cl. 364-183.000.
Sakata, Isao; Nakajima, Susumu; Koshimizu, Koichi; Samejima, Natsuki; Inohara, Kazumi; and Takata, Hiroyuki. 9-desoxo-9-hydroxypheophorbide derivatives and alkaline salts thereof. 4,604,241, Cl. 540-145.000.
Sakura Color Products Corp.: *See*—
Shioi, Keiko; and Shoji, Yukito, 4,604,139, Cl. 106-23.000.
Sakurada, Nobuaki; Watanabe, Yoshitaka; Kawamura, Hideaki; and Sato, Yuichi, to Canon Kabushiki Kaisha. Image forming method and apparatus. 4,604,654, Cl. 358-298.000.
Sakurai, Kiyomi; and Konishi, Katsuzi, to Nippon Paint Co., Ltd. Water developable photosensitive resinous composition. 4,604,343, Cl. 430-281.000.
Sakurai, Toshiharu, to Kabushiki Kaisha Toshiba. Fe-Ni-Cu leadframe. 4,604,642, Cl. 357-70.000.
Salmon, Michael E., to General Motors Corporation. Electronic transmission shift controller having a controlled alignment valve mechanism. 4,603,603, Cl. 74-868.000.
Salomon, Georges P. J., to Salomon S.A. Ski binding. 4,603,880, Cl. 280-628.000.
Salomon S.A.: *See*—
Salomon, Georges P. J., 4,603,880, Cl. 280-628.000.
Salvadori, Bruno: *See*—
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Samaritoni, Jack G.: *See*—
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Samejima, Natsuki: *See*—
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Samuel, Robert A.: *See*—
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Samuelsen, Peter, to Coloplast A/S. Return valve for a bag for collecting liquid excretions from the human body. 4,604,095, Cl. 604-323.000.
Sand, I. Daniel; Shepherd, Freddie A.; and Fagerburg, David R., to Eastman Kodak Company. Bonding compositions and shaped articles utilizing the bonding compositions. 4,604,446, Cl. 528-173.000.
Sanden Corporation: *See*—
Terauchi, Kiyoshi, 4,604,039, Cl. 418-55.000.
Sanderford, Hugh B., Jr.; and Souvestre, John R., to Protection Products Corporation. Security device simulating currency pack or the like. 4,604,607, Cl. 340-539.000.
Sanders Associates, Inc.: *See*—
Burrows, James L., 4,604,723, Cl. 364-786.000.
Stromswold, Chester E., 4,604,626, Cl. 343-417.000.
Sanders, Gerald J.: *See*—
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Sandoz Ltd.: *See*—
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Sanitation Equipment Limited: *See*—
Stewart, John M., 4,603,443, Cl. 4-314.000.
Sanko Kikai Co., Ltd.: *See*—
Hirohata, Nobuyuki, 4,603,458, Cl. 29-130.000.
Sankyo Company Limited: *See*—
Ide, Junya; Muramatsu, Shigeki; Tsujita, Yoshio; and Kuroda, Masao, 4,604,472, Cl. 549-292.000.
Sanofi: *See*—
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Sanpe, Hideyuki: *See*—
Inagaki, Syoji; Sanpe, Hideyuki; and Makihara, Norimitsu, 4,604,560, Cl. 318-567.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
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Santangelo, John A.; and Worrick, Charles B., III, to Codman & Shurtleff, Inc. Pressure regulated irrigation system for arthroscopy. 4,604,089, Cl. 604-30.000.
Santrade Ltd.: *See*—
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Sanwa Kagaku Kenyusho Co., Ltd.: *See*—
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Sanyo Electric Co., Ltd.: *See*—
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Sarumaru, Kohei; Shibano, Takeshi; Ishii, Yoichi; and Yamamoto, Etsuji, to Mitsubishi Petrochemical Company, Limited. Process for regenerating a catalyst. 4,604,370, Cl. 502-38.000.
Sasaki, Hirofumi: *See*—
Kawaguchi, Hiroshi; Sasaki, Hirofumi; Nishida, Mamoru; and Harada, Shinichi, 4,603,729, Cl. 164-442.000.
Sasaoka, Michio: *See*—
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Sasayama, Takao; Kato, Kazuo; and Naito, Masayoshi, to Hitachi, Ltd. FET-bipolar switching device and circuit. 4,604,535, Cl. 307-570.000.
Sato, Fumitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Data processing system with error correction. 4,604,748, Cl. 371-38.000.
Sato, Isao: *See*—
Ishibashi, Yoji; Sato, Isao; Kato, Fumio; Ohmori, Takashi; and Hayashi, Noriyuki, 4,603,548, Cl. 60-39.060.
Sato, Kyosaku, to Polysar Limited. Vulcanizable polymer compositions with improved scorch. 4,604,420, Cl. 524-394.000.
Sato, Yoichi: *See*—
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Sato, Yuichi: *See*—
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Satterthwaite, Edward W. Modular frame structure and building system. 4,603,853, Cl. 272-113.000.
Saunders, Libert C.: *See*—
Collins, Raymond F.; Ramsden, Christopher A.; Saunders, Libert C.; and Warne, Peter J., 4,604,400, Cl. 514-300.000.
Sawada, Haruji; and Watanuki, Masaaki, to Kabushiki Kaisha Yakult Honsha. Method for producing conjugated ursodeoxycholic acids by means of microbial transformation. 4,604,353, Cl. 435-58.000.
Sawada, Ken: *See*—
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Sawada, Seigo: *See*—
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Sawai, Masaaki, to Hitachi, Ltd. Semiconductor laser module having an improved temperature control arrangement. 4,604,753, Cl. 372-36.000.

Scallet, Barrett L.: *See—*
Katz, Edward; Benedicktus, Jon J.; Knarr, Edward L.; and Scallet, Barrett L., 4,604,354, Cl. 435-94.000.

Scandpower, Inc.: *See—*
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Schaack, John V.: *See—*
Borcherdt, Roger D.; Fletcher, Jon P.; Warrick, Richard E.; Maxwell, Gary L.; Jensen, Edward G.; and Schaack, John V., 4,604,699, Cl. 364-420.000.

Schaerer, Jean E. Forward feed assembly for continuous forward feed of open tubular fabric under controlled tension. 4,603,799, Cl. 226-171.000.

Schafer, Paul: *See—*
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Schaffner, Bernard P., Jr., to Channellock, Inc. Pivot connection for slip joint pliers. 4,603,607, Cl. 81-414.000.

Schardt, Peter: *See—*
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Scheinecker, Alois: *See—*
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Schell, Helmut: *See—*
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Scheller, Bernfrid: *See—*
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Schellhorn, Verne L.: *See—*
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Schering AG: *See—*
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Scheurecker, Werner; and Scheinecker, Alois, to Voest-Alpine International Corporation. Ladle support machine. 4,603,841, Cl. 266-44.000.

Schewe, Roy A.: *See—*
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Schibrowski, Jurgen: *See—*
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Franz-Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,603,998, Cl. 403-322.000.

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Posluszny, Thomas; Smith, Kevin D.; and Schlie, Paul W., 4,604,574, Cl. 324-207.000.

Schlueter, Gary: *See—*
Greenlaw, John W.; Schlueter, Gary R.; and Kettlitz, Karsten, 4,603,944, Cl. 350-252.000.

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Greenlaw, John W.; Schlueter, Gary R.; and Kettlitz, Karsten, 4,603,944, Cl. 350-252.000.

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Schmedemann, Walter, to U.S. Philips Corporation. X-ray unit which can be swivelled about a horizontal axis. 4,603,845, Cl. 269-323.000.

Schmid, Christian: *See—*
Widmer, Hans R.; and Schmid, Christian, 4,604,308, Cl. 428-35.000.

Schmid, Gunther: *See—*
Grunwald, Werner; Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; and Schmid, Kurt, 4,603,667, Cl. 123-297.000.

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Schmid, Olaf: *See—*
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,604,598, Cl. 335-128.000.

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Schmidt, Harald: *See—*
Rollenitz, Leopold; Schmidt, Harald; Freudenschuss, Otto; and Morell, Josef, 4,603,811, Cl. 239-90.000.

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Bell, John M.; and Schmidt, Peter J., 4,604,497, Cl. 174-110.00F.

Schmitt, Wolfgang: *See—*
Fuchs, Dieter; and Schmitt, Wolfgang, 4,603,866, Cl. 277-152.000.

Schnaibel, Eberhard: *See—*
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,603,675, Cl. 123-478.000.

Schnaitl, Matthias. Implement for heavy athletics. 4,603,859, Cl. 272-142.000.

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Schneider, Erich: *See—*
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,603,675, Cl. 123-478.000.

Schneider, Georg, to Koenig & Bauer Aktiengesellschaft. Ink return system for printing machines. 4,603,632, Cl. 101-364.000.

Schneider, Ralph J.: *See—*
Clancy, Kevin F.; and Schneider, Ralph J., 4,604,509, Cl. 200-159.00B.

Schnurle, Hans: *See—*
Bertsch, Richard; Gunther, Dieter; Schnurle, Hans; and Steinbrenner, Ulrich, 4,603,670, Cl. 123-440.000.

Schoendube, Charles W., to General Electric Company. Distribution transformer with surge protection device. 4,604,673, Cl. 361-38.000.

Schott, Eberhard P.; Fischer, Volker; Jung, Johann; and Rosebrock, Henning, to BASF Aktiengesellschaft. Influencing plant growth. 4,604,129, Cl. 71-76.000.

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Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muaceic, Gojko, 4,604,468, Cl. 548-305.000.

Schubert, Johannes M.; and Geuppert, Gerhard, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Arrangement for application of liquids, in particular coating unit for a printing press. 4,603,633, Cl. 101-366.000.

Schubert, Keith E.: *See—*
Pollak, Philip, Jr.; and Schubert, Keith E., 4,603,627, Cl. 101-91.000.

Schuessler, Richard C.: *See—*
Shevtchuk, Victor; Chau, Nhut; and Schuessler, Richard C., 4,604,298, Cl. 427-96.000.

Schuil, Roelof E.: *See—*
van Koesveld, Jan L.; and Schuil, Roelof E., 4,604,550, Cl. 313-478.000.

Schuler, Claus: *See—*
Gobrecht, Jens; and Schuler, Claus, 4,603,474, Cl. 29-597.000.

Schulte, Alfons: *See—*
Beck, Rainer; and Schulte, Alfons, 4,603,951, Cl. 351-156.000.

Schultheis, Stephen K., to Container Development Company. Portable sealing device. 4,603,535, Cl. 53-373.000.

Schultz, Gilbert: *See—*
Katchka, Jay R.; and Schultz, Gilbert, 4,604,049, Cl. 431-80.000.

Schulz, Leslie A.: *See—*
Roberts, William P.; and Schulz, Leslie A., 4,604,427, Cl. 525-185.000.

Schunter, Roland: *See—*
Osberghaus, Rainer; Scheller, Bernfrid; Schunter, Roland; Kresse, Franz; and Schell, Helmut, 4,603,450, Cl. 15-147.00A.

Schutz, Ernst. Roller skate undercarriage with adjustable rollers. 4,603,868, Cl. 280-7.130.

Schutzle, Gunter, to Allied Corporation. Electric plug connector and method of manufacturing. 4,603,475, Cl. 29-857.000.

Schwabe, Ulrich; Jacobs, Erwin P.; and Neppl, Franz, to Siemens Aktiengesellschaft. Method of making MOS FETs using silicate glass layer as gate edge masking for ion implantation. 4,603,472, Cl. 29-576.00B.

Schwan, Eduard A.: *See—*
Schwan, Herbert A.; and Schwan, Eduard A., 4,604,682, Cl. 364-200.000.

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Schwartz, Robert E.; and Noble, Roger K., to John Zink Company. Methods and apparatus for burning fuel with low NO_x formation. 4,604,048, Cl. 431-8.000.

Schwend, Fred N.: *See—*
McNeill, Samuel J., 4,603,871, Cl. 280-33.99C.

SCM Corporation: *See—*
Whitman, Charles I., 4,604,259, Cl. 75-247.000.

Scott, George V., to Colgate-Palmolive Co. Stabilization of carrageenan-containing toothpaste. 4,604,280, Cl. 424-49.000.

Scott-Kestin, Colin B.: *See—*
Watkins, Roger D.; Gillespie, Arthur B.; Deighton, Michael O.; Pike, Roger B.; and Scott-Kestin, Colin B., 4,604,612, Cl. 340-582.000.

Seago, James L., to Du Pont de Nemours, E. I., and Company. Perfluorosulfonic acid polymer-coated indicator electrodes. 4,604,182, Cl. 204-403.000.

Seamone, Woodrow; and Loveless, John H., to Johns Hopkins University, The. Prosthetic elbow with a motor-driven release mechanism. 4,604,098, Cl. 623-60.000.

Sebelle, Leslie W. Variable exercise apparatus. 4,603,855, Cl. 272-117.000.

Sebilet, Bruno R.: *See—*
Delon, Patrice C. G.; Fourreaux, Gerard D.; Nicolas, Michel J. R.; and Sebilet, Bruno R., 4,604,622, Cl. 343-5.0PD.

Segawa, Shingo: *See—*
Udagawa, Masakazu; Saito, Masaaki; Segawa, Shingo; and Noda, Masahiro, 4,603,898, Cl. 296-91.000.

Seiko Epson Corporation: *See—*
Karaki, Nobuo, 4,604,555, Cl. 315-383.000.
Morozumi, Shinji, 4,604,617, Cl. 340-805.000.

Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Odor-stabilized mercaptoalkyl alkoxysilanes and a method for their preparation. 4,604,476, Cl. 556-401.000.

Seitetsu Kagaku Co., Ltd.: *See—*
Seno, Taiko; Okubo, Yasuto; Kawamura, Masao; Akutsu, Seiichi; and Fukuda, Hirosuke, 4,604,349, Cl. 435-15.000.

Seki, Hiromi: *See—*
Watanabe, Kazuo; Seki, Hiromi; Yamada, Kenji; and Tsuyama, Yoshito, 4,603,806, Cl. 228-152.000.

Sekiba, Toshinobu: *See—*
Yotsumoto, Yoshiharu; Kubota, Katsuhiko; and Sekiba, Toshinobu, 4,604,643, Cl. 357-75.000.

Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, to Nissan Motor Company, Limited. System and method for detecting driver drowsiness including detection of steering rotation and reversal. 4,604,611, Cl. 340-576.000.

Semiconductor Energy Lab. Co.: *See—*
Yamazaki, Shunpei, 4,603,470, Cl. 29-572.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei, 4,604,231, Cl. 252-518.000.

Senda, Atsuo; Numata, Toshi; Nakagawa, Takuji; and Ogiso, Yoshifumi, to Murata Manufacturing Co., Ltd. Ceramic capacitor. 4,604,676, Cl. 361-309.000.

Sendzimir, Tadeusz. Pressure controlled plate mill. 4,603,569, Cl. 72-245.000.

Seno, Taiko; Okubo, Yasuto; Kawamura, Masao; Akutsu, Seiichi; and Fukuda, Hirosuke, to Seitetsu Kagaku Co., Ltd. Process for preparing uridine diphosphate-N-acetylgalactosamine. 4,604,349, Cl. 435-15.000.

Senshu, Takao: *See—*
Suefuji, Kazutaka; Yasuda, Hiromu; Hayashi, Masakatsu; Arata, Tetsuya; Oguni, Kensaku; Kuroda, Shigeaki; Atsumi, Akira; Ishibane, Kyuhei; Terada, Hirokiyo; Senshu, Takao; and Kogure, Hiroshi, 4,603,556, Cl. 62-180.000.

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Vilotte, Alain; and Jacquart, Alain, 4,603,809, Cl. 229-2.5EC.

Sequin, Herb J. J.; Nam, Kyong H.; and Capjack, Clarence E. Magnetic stabilization of high power glow discharges. 4,604,752, Cl. 372-29.000.

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Ripani, Sergio; and Serafini, Giulio, 4,603,815, Cl. 241-36.000.

Sercel, Anthony D.: *See—*
Elslager, Edward F.; Werbel, Leslie M.; Ortwine, Daniel F.; Worth, Donald F.; Showalter, Howard D. H.; Capps, David B.; Berman, Ellen M.; Gregor, Vlad E.; and Sercel, Anthony D., 4,604,390, Cl. 514-222.000.

Sergeev, Jury N.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Serizawa, Kenkichi: *See—*
Komatsu, Isamu; and Serizawa, Kenkichi, 4,603,511, Cl. 51-165.710.

Sermidi, Franco: *See—*
Bretti, Carlo; Sermidi, Franco; and Agnelli, Medardo, 4,603,465, Cl. 29-564.600.

Sestanj, Kazimir: *See—*
Bellini, Francesco; and Sestanj, Kazimir, 4,604,406, Cl. 514-562.000.

SEVKO, Inc.: *See—*
Ryan, Delvin R., Jr., 4,603,781, Cl. 211-90.000.

Seyler, Jay K.: *See—*
Orlowski, Ronald C.; and Seyler, Jay K., 4,604,236, Cl. 530-307.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,604,237, Cl. 530-307.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,604,238, Cl. 530-307.000.

Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., to Gomelskoe Spetsialnoe Konstruktorsko-Tekhnologicheskoe Bjuro Seismicheskoi Tekhniki S Opytnym Proizvodstvom. Automated apparatus for handling elongated well elements such as pipes. 4,604,724, Cl. 364-478.000.

Shah, Ashwin H.; Chatterjee, Pallab K.; Gallia, James D.; and Mahant-Shetti, Shivaling S., to Texas Instruments Incorporated. Memory with configuration RAM. 4,604,727, Cl. 365-189.000.

Shapiro, Rafael, to Du Pont de Nemours, E. I., and Company. Herbicidal N-[pyrimidine aminocarbonyl]isothiazole sulfonamides. 4,604,130, Cl. 71-90.000.

Sharp Kabushiki Kaisha: *See—*
Ikemoto, Yutaka; and Sawada, Ken, 4,604,698, Cl. 364-419.000.
Kuranishi, Masaaki; Nonaka, Susumu; Furukawa, Koichi; and Siozaki, Fumio, 4,603,987, Cl. 400-639.100.

Shaum, Richard L.; and Burr, Edward A., to Schaum, Richard L. Trolling speed indicator. 4,603,579, Cl. 73-186.000.

Shave, William H., to Pfizer Hospital Products Group, Inc. Method of preparing a double sterile package. 4,603,538, Cl. 53-425.000.

Shaw, Herbert J.; Digonnet, Michel J. F.; Bergh, Ralph A.; Sorin, Wayne V.; and Kolner, Brian H., to Leland Stanford Junior University, Board of Trustees of the. Fiber optic dye amplifier. 4,603,940, Cl. 350-96.150.

Sheaffer, Benjamin L.: *See—*
Hesterberg, William G.; Donahue, Raymond J.; and Sheaffer, Benjamin L., 4,603,665, Cl. 123-195.00R.

Shelby Williams Industries, Inc.: *See—*
Tolleson, Thomas H.; and Hartzog, Steve B., 4,603,904, Cl. 297-296.000.

Shell Oil Company: *See—*
Rootsaert, Walter J. M.; and van der Loo, Carolus H., 4,604,233, Cl. 252-558.000.

Shepard, Neal F., Jr., to General Electric Company. Photovoltaic cell array with light concentrating reflectors. 4,604,494, Cl. 136-246.000.

Shepherd, Freddie A.: *See—*
Sand, I. Daniel; Shepherd, Freddie A.; and Fagerburg, David R., 4,604,446, Cl. 528-173.000.

Shepley, Leonard D.: *See—*
Reiter, Bernadette G.; Castor, John W.; Blume, R. J. Carter; Schewe, Roy A.; and Shepley, Leonard D., 4,604,686, Cl. 364-200.000.

Sherman Industries, Inc.: *See—*
Beer, Carl C., 4,603,447, Cl. 15-97.00B.

Shevtchuk, Victor; Chau, Nhut; and Schuessler, Richard C., to Gulton Industries, Inc. Finger line screen printing method and apparatus. 4,604,298, Cl. 427-96.000.

Shi, Joseph C. S., to Thiele Kaolin Company. Method of beneficiating kaolin clay utilizing ammonium salts. 4,604,369, Cl. 501-148.000.

Shibahara, Makoto: *See—*
Kato, Shigeru; Nakaho, Junichi; and Shibahara, Makoto, 4,603,946, Cl. 350-331.00R.

Shibano, Takeshi: *See—*
Sarumaru, Kohei; Shibano, Takeshi; Ishii, Yoichi; and Yamamoto, Etsuji, 4,604,370, Cl. 502-38.000.

Shibaura Denki Kabushiki Kaisha: *See—*
Konishi, Satoshi, 4,604,731, Cl. 365-203.000.

Shibuya, Tadao, to Kabushiki Kaisha Meidensha. Power supply equipment backup system for interruption of service. 4,604,530, Cl. 307-66.000.

Shiga, Shoji; Hayakawa, Takayuki; and Kamiyama, Yasuo, to Furukawa Electrical Company, Ltd. Process for metal plating a stainless steel. 4,604,169, Cl. 204-34.000.

Shiina, Shuichi: *See—*
Tanigawa, Shigeho; Shiina, Shuichi; and Uchida, Kimio, 4,604,042, Cl. 425-3.000.

Shimada, Minoru: *See—*
Ida, Mitsuru; and Shimada, Minoru, 4,604,662, Cl. 360-74.100.

Shimaguchi, Takashi: *See—*
Natori, Tatsuo; Nakae, Hideo; Watanabe, Akihide; and Shimaguchi, Takashi, 4,604,141, Cl. 106-38.350.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,604,078, Cl. 474-80.000.

Shimizu, Isamu: *See—*
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, 4,603,722, Cl. 152-209.00R.

Shimizu, Keiichi: *See—*
Mochida, Haruo; Shimizu, Keiichi; and Okuya, Shigetami, 4,603,563, Cl. 70-276.000.

Shimizu, Kiyoshi: *See—*
Harada, Susumu; Shimizu, Kiyoshi; and Ujiie, Masayuki, 4,604,451, Cl. 525-328.200.

Shimizu, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Document filing system. 4,604,653, Cl. 358-256.000.

Shimizu, Nobuaki; Tsubouchi, Toshiyuki; and Hata, Hitoshi, to Idemitsu Kosan Company Limited. Dicyclohexylcyclopentane compounds. 4,604,492, Cl. 585-360.000.

Shimizu, Nobuaki; Tsubouchi, Toshiyuki; and Hata, Hitoshi, to Idemitsu Kosan Company Limited. 1-cyclohexyl-1,4-dimethyl decahydronaphthalene and a working fluid for traction drive formulated therewith. 4,604,493, Cl. 585-360.000.

Shimizu, Shigeaki; and Arai, Yoshio, to NEC Corporation. Method of producing electrolytic capacitor with Al-Ti anode body. 4,604,260, Cl. 419-2.000.

Shimizu, Wataru; and Yamashita, Akira, to Kabushiki Kaisha SG. Multiple output rotational position detection device. 4,604,575, Cl. 324-208.000.

Shimizu, Yasuhiko: *See—*
Ikada, Yoshito; Gen, Shokyu; Shimizu, Yasuhiko; Tamura, Koichi; Nakamura, Tatsuo; Kimura, Sosuke; Cho, Tsuneo; Tadokoro, Hideki; and Hori, Kazuaki, 4,603,695, Cl. 128-334.00R.

Shimp, David A., to Celanese Corporation. Metal carboxylate alkylphenol curing catalyst for polycyanate ester of polyhydric phenol. 4,604,452, Cl. 528-422.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Takamizawa, Minoru; Kobayashi, Taishi; Hayashida, Akira; and Takeda, Yoshihumi, 4,604,367, Cl. 501-95.000.

Shindo, Kenzi: *See—*
Morishita, Satoru; Shindo, Kenzi; Tozawa, Isao; and Taga, Yukio, 4,604,372, Cl. 502-62.000.

Shindo, Masanori; Aoki, Yusuke; Kataoka, Yosizumi; Enomoto, Susumu; and Nakamura, Minoru, to Nippon Polyurethane Industry Co., Ltd. Process for isocyanurating hexamethylene-diisocyanate using a sodium or potassium carboxylate catalyst and a paint composi-

tion comprising the product of said process and polyols. 4,604,418, Cl. 524-296.000.
Shinko Electric Industries Co., Ltd.: *See*—
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Shinmi, Hideo: *See*—
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Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Semiconductor memory. 4,604,749, Cl. 371-38.000.
Shinomura, Ryuichi: *See*—
Umemura, Shinichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Shinomura, Ryuichi, 4,604,543, Cl. 310-334.000.
Shinzawa, Motohiro, to Nissan Motor Company, Limited. Exhaust particle removing system for an internal combustion engine. 4,603,550, Cl. 60-274.000.
Shioi, Keiko; and Shoji, Yukito, to Sakura Color Products Corp. Dual color ink composition. 4,604,139, Cl. 106-23.000.
Shionogi & Co., Ltd.: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,604,460, Cl. 544-90.000.
Shirahata, Ryuji; and Yanai, Akio, to Fuji Photo Film Co., Ltd. Process for producing magnetic recording medium. 4,604,293, Cl. 427-42.000.
Shiroi, Takashi: *See*—
Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,604,457, Cl. 540-223.000.
Shirozu, Masakazu: *See*—
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Shklyarman, Sergei S.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.
Shoichiro, Uyeo: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,604,460, Cl. 544-90.000.
Shoji, Mitihiro; and Mikiya, Toshio, to Nitto Kohki Co., Ltd. Drilling machine having electromagnetic base. 4,604,006, Cl. 408-76.000.
Shoji, Yukito: *See*—
Shioi, Keiko; and Shoji, Yukito, 4,604,139, Cl. 106-23.000.
Shook, Daniel R., to United States of America, Health and Human Services. Toposcopic catheter and method of fabrication. 4,604,094, Cl. 604-271.000.
Showalter, Howard D. H.: *See*—
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Shpilevsky, Stanislav K.: *See*—
Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., 4,604,724, Cl. 364-478.000.
Shu, Paul: *See*—
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Shustov, Vladimir P.: *See*—
Naumov, Jury I.; Juzefovich, Dmitry K.; Epifanova, Valentina S.; Kucherenko, Vladimir I.; Flerov, Valery N.; Praporov, Anatoly M.; Shustov, Vladimir P.; Sychev, Alexel E.; Korolev, Georgy V.; Kotov, Evgeny P.; and Derevyanko, Yan N., 4,604,175, Cl. 204-151.000.
SI Handling Systems Inc.: *See*—
Jacoby, Charles E., 4,603,720, Cl. 152-209.00R.
Sleep, Craig F., 4,603,639, Cl. 104-252.000.
Sibley, Richard D.; and Keller, William F., to Koso International, Inc. Device responsive to shock forces. 4,603,591, Cl. 74-2.000.
Siebe North, Inc.: *See*—
Montesi, Edward N., 4,603,692, Cl. 128-207.110.
Siebert, Georg, to Artec Design GmbH. Yarn twisting and winding apparatus. 4,603,545, Cl. 57-68.000.
Siebold, Quentin R.; and Labuhn, Walter, to Legrand Industries Ltd. Off-vertical pumping unit. 4,603,592, Cl. 74-41.000.
Siegl, Peter K. S.: *See*—
Kaczorowski, Gregory J.; and Siegl, Peter K. S., 4,604,394, Cl. 514-255.000.
Sieling, Helmut: *See*—
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Siemens Aktiengesellschaft: *See*—
Angerer, Heinrich; and Sinha, Badri, 4,604,594, Cl. 333-194.000.
Feigt, Ingmar; Feldtkeller, Ernst; and Lange, Gottfried, 4,604,634, Cl. 346-160.000.
Hoer, Leopold, 4,603,933, Cl. 339-75.00P.
Lechner, Ernst F.; and Vache, Peter, 4,603,457, Cl. 29-33.00F.
Moustakas, Steven; and Witte, Hans-Hermann, 4,604,756, Cl. 375-113.000.
Mund, Konrad; Freller, Helmut; and Hoerauf, Friedrich, 4,603,704, Cl. 128-784.000.
Ruhle, Wolfgang; and Weyrich, Claus, 4,604,637, Cl. 357-17.000.
Schwabe, Ulrich; Jacobs, Erwin P.; and Neppl, Franz, 4,603,472, Cl. 29-576.00B.
Ullenboom, Hermann, 4,603,984, Cl. 400-121.000.
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Siemon Company, The: *See*—
Knickerbocker, Robert H., 4,603,935, Cl. 339-97.00P.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Kopp, Georg, 4,603,540, Cl. 53-546.000.
Sigerist, Helmut, to Venturetech Enterprises, Inc. Panel installation. 4,603,528, Cl. 52-464.000.
Silbermann, Rainer: *See*—
Woest, Wolfgang; Silbermann, Rainer; and Hegner, Frank, 4,603,455, Cl. 29-25.420.
Sill, Karl: *See*—
Doppling, Horst; Hertrich, Steffen; Poschl, Walter; Ritter, Joachim; and Sill, Karl, 4,603,923, Cl. 384-7.000.
Sills, Robert L.: *See*—
Elwell, Dennis L.; and Sills, Robert L., 4,604,013, Cl. 410-106.000.
Silvent, Alain: *See*—
Perroud, Anne-Marie; and Silvent, Alain, 4,604,228, Cl. 252-492.000.
Silver, Brian H., to Kendall Company, The. Liquid drainage system with vertical movable light emitter and detector. 4,604,092, Cl. 604-246.000.
Simborski, Anthony. Horizontal fishing rod motion control. 4,603,499, Cl. 43-19.200.
Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Perfecting printing process and apparatus for a sheet-fed offset press. 4,603,631, Cl. 101-229.000.
Simkin, Frank. Fence support member. 4,603,840, Cl. 256-11.000.
Simpson, George R. Ink projecting typewriter ribbon. 4,603,986, Cl. 400-241.200.
Simpson, Richard O.: *See*—
Amezcua, Robert; Clements, Silous F.; Coenen, John S.; DaFoe, Ralph H.; Day, Michael N.; Ross, Dennis M.; and Simpson, Richard O., 4,604,710, Cl. 364-900.000.
Simulated Designs, Ltd.: *See*—
Norman, Theodore A.; and Norman, Van B., 4,604,718, Cl. 364-578.000.
Singh, Baldev: *See*—
Lesher, George Y.; and Singh, Baldev, 4,604,399, Cl. 514-300.000.
Singh, Paramjit: *See*—
Goodall, Richard L.; and Singh, Paramjit, 4,603,888, Cl. 285-55.000.
Sinha, Badri: *See*—
Angerer, Heinrich; and Sinha, Badri, 4,604,594, Cl. 333-194.000.
Siozaki, Fumio: *See*—
Kuranishi, Masaaki; Nonaka, Susumu; Furukawa, Koichi; and Siozaki, Fumio, 4,603,987, Cl. 400-639.100.
Sivilotti, Olivo G., to Alcan International Limited. Electrolysis cell for a molten electrolyte. 4,604,177, Cl. 204-244.000.
Siwersson, Olle L.; and Wall, Arne E., to AB Scaniainventor. Vertical conveyor for bulk goods. 4,603,774, Cl. 198-518.000.
Sjoquist, Dennis R., to Evolutionary Concepts, Inc. Solenoid actuator with bleed screw. 4,603,832, Cl. 251-30.020.
Skeen, Solomon L. Sliding pivot knee joint. 4,603,690, Cl. 128-80.00C.
Skeie, Halvor, to X-Cyte Inc. Surface acoustic wave passive transponder having non-reflective transducers and pads. 4,604,623, Cl. 343-6.80R.
Sklut, Robert L.: *See*—
Kukucka, William P.; Sklut, Robert L.; and Gauronski, John F., 4,603,971, Cl. 355-133.000.
Sleep, Craig F., to SI Handling Systems Inc. Traffic control device for driverless vehicles. 4,603,639, Cl. 104-252.000.
Smallwood, Peter V., to Imperial Chemical Industries PLC. Treatment of aqueous suspensions of vinyl chloride polymers. 4,604,419, Cl. 524-318.000.
Smernoff, Ronald B., to Analytical Products, Inc. Cell for gas sample equilibrator. 4,604,263, Cl. 422-50.000.
Smith, Hoke, Jr. Automatic locking and centering wide range tow hitch. 4,603,878, Cl. 280-478.00A.
Smith International Inc.: *See*—
Hall, David R.; Russell, Monte E.; and Hall, H. Tracy, Jr., 4,604,106, Cl. 51-293.000.
Hendrick, Fred W., 4,603,834, Cl. 251-121.000.
Smith, Kevin D.: *See*—
Posluszny, Thomas; Smith, Kevin D.; and Schlie, Paul W., 4,604,574, Cl. 324-207.000.
Smith, Richard A.; and Cassels, Robert, to Beecham Group p.l.c. Protein C enzyme derivatives. 4,604,285, Cl. 424-94.000.
Smith, Richard R.; and Kern, Charles L., Jr., to Goodyear Tire & Rubber Company, The. Multi-layer polyisophthalate and polyterephthalate articles and process therefor. 4,604,257, Cl. 264-513.000.
Smith, Robert A.; and Goodman, Maxine. Pharmaceutical gel composition. 4,604,384, Cl. 514-179.000.

Smith, Roger, Jr.; and Hebard, Harry D., to Hughes Tool Company. Stand jumping and stabbing guide device and method. 4,603,464, Cl. 29-428.000.

Smith, Ronald A.; Jackson, James M.; Lehfeldt, Carl L.; Cygnarowicz, Leonard P.; Moshfegh, Khosro; Blanchard, Kenneth L.; and Nelson, Kenneth J., to Ronald A. Smith & Associates. Programmable manufacturing system for load/support arms for magnetic disk drive data storage systems. 4,603,567, Cl. 72-8.000.

Smith, Terence J.: *See—*
Irving, Edward; and Smith, Terence J., 4,604,344, Cl. 430-325.000.

Smith, Thomas M. Radiant heating. 4,604,054, Cl. 431-328.000.

SmithKline Beckman Corporation: *See—*
Callahan, James F.; Huffman, William F.; Moore, Michael L.; and Yim, Nelson C., 4,604,378, Cl. 514-11.000.

Snide, James A.; and Morrisey, Edward J., to United States of America, Air Force. Variable density frangible projectile. 4,603,637, Cl. 102-529.000.

Sobczak, Zbigniew P., to NCR Corporation. Formation and planarization of silicon-on-insulator structures. 4,604,162, Cl. 156-657.000.

S.A. Atecmi: *See—*
Vasseur, Jackie; and Vasseur, Roger, 4,603,896, Cl. 294-2.000.

Societe Anonyme Styled: SANOFI: *See—*
Biziere, Kathleen; Chambon, Jean-Pierre; and Molimard, Jean-Charles, 4,604,383, Cl. 514-63.000.

Societe D'Etude et D'Application Industrielle de Brevets: *See—*
de la Poype, Roland, 4,603,536, Cl. 53-410.000.

Societe Nationale de l'Amiante: *See—*
Lalancette, Jean M.; Chevalier-Bultel, Jean P.; and Desrosiers, Luc, 4,604,140, Cl. 106-38.900.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A.: *See—*
Delon, Patrice C. G.; Fourreaux, Gerard D.; Nicolas, Michel J. R.; and Sebilet, Bruno R., 4,604,622, Cl. 343-5.0PD.
Naudet, Jacky, 4,604,030, Cl. 415-126.000.

Societe Nationale Industrielle et Aerospatiale: *See—*
Joly, Jean-Louis; and Lallemant, Bernard, 4,603,796, Cl. 222-400.700.

Soled, Stuart L.; and Fiato, Rocco A., to Exxon Research and Engineering Co. Manganese-spinel catalysts in CO/H_2 olefin synthesis. 4,604,375, Cl. 502-241.000.

Soltis Charles W. Air filtering and distribution for laminar flow clean room. 4,603,618, Cl. 98-31.500.

Sommer, Wayne D.: *See—*
Eaves, Fred W.; and Sommer, Wayne D., 4,604,704, Cl. 364-478.000.

Sondergeld, Manfred A. J.; and Grossa, Mario, to Du Pont de Nemours, E. I., and Company. Photopolymerizable mixture and recording material produced from it. 4,604,342, Cl. 430-281.000.

Sonoda, Yoshiteru: *See—*
Yamamoto, Masahiko; Nishino, Yoshinori; Uda, Tadayoshi; Sonoda, Yoshiteru; and Suyama, Toshio, 4,604,254, Cl. 264-254.000.

Sony Corporation: *See—*
Fukami, Tadashi; and Odaka, Kentaro, 4,604,657, Cl. 360-32.000.
Ida, Mitsuru; and Shimada, Minoru, 4,604,662, Cl. 360-74.100.
Kojima, Chiaki; Hasegawa, Kayoko; and Miyahara, Kousuke, 4,603,938, Cl. 350-3.720.
Saito, Tsunenari; Murata, Akio; and Sakai, Koichi, 4,604,547, Cl. 313-413.000.

Sorenson, Robert B., to Hughes Tool Company - USA. Replaceable bit nozzle. 4,603,750, Cl. 175-340.000.

Sorin, Wayne V.: *See—*
Shaw, Herbert J.; Digonnet, Michel J. F.; Bergh, Ralph A.; Sorin, Wayne V.; and Kolner, Brian H., 4,603,940, Cl. 350-96.150.

Southall, Kenneth: *See—*
Dailey, Nils; Rai, Vishva; Southall, Kenneth; and Webster, Timothy J., 4,604,198, Cl. 210-198.200.

Souvestre, John R.: *See—*
Sanderford, Hugh B., Jr.; and Souvestre, John R., 4,604,607, Cl. 340-539.000.

Sovey, James S.: *See—*
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., 4,604,181, Cl. 204-298.000.

Span-America Medical Systems, Inc.: *See—*
Spann, Donald C., 4,603,445, Cl. 5-481.000.

Spanier, Henry C.; Spiel, Albert; and Rinaldo, Gary M. J., to Nabisco Brands, Inc. Process for preparing whole wheat bread and mix for same. 4,604,289, Cl. 426-19.000.

Spann, Donald C., to Span-America Medical Systems, Inc. Support pad and method of manufacture. 4,603,445, Cl. 5-481.000.

Spear, Dean M.: *See—*
Raley, Garland E.; and Spear, Dean M., 4,604,156, Cl. 156-294.000.

Spector, George: *See—*
Spierer, Stuart; and Spector, George, 4,603,791, Cl. 220-404.000.

Speicher, Vernon L.; and Bach, Stanley M., Jr., to Mirowski, Mieczyslaw. Intravascular multiple electrode unitary catheter. 4,603,705, Cl. 128-786.000.

Spencer, Herbert J. C., to Telspec Limited. Apparatus for providing fluid pressure for testing a seal. 4,603,576, Cl. 73-40.000.

Sperry Corporation: *See—*
Paul, Maynard C., 4,604,176, Cl. 204-192.00M.
Wing, Willis G., 4,603,483, Cl. 33-324.000.

Spiegel, Nikolaus: *See—*
Jeschke, Willi; and Spiegel, Nikolaus, 4,603,641, Cl. 101-415.100.

Spiel, Albert: *See—*
Spanier, Henry C.; Spiel, Albert; and Rinaldo, Gary M. J., 4,604,289, Cl. 426-19.000.

Spierer, Stuart; and Spector, George. Refund bottle and can bag. 4,603,791, Cl. 220-404.000.

Spikes, Hugh D. Line protector. 4,603,737, Cl. 166-241.000.

Spire Corporation: *See—*
Evans, Robert D.; and Halverson, Ward D., 4,604,292, Cl. 427-39.000.

Sprecker, Mark A.: *See—*
Wiegers, Wilhelmus J.; and Sprecker, Mark A., 4,604,487, Cl. 568-715.000.

Spreeuwers, Harm R., to Akzo N.V. Tubular object of a layered plastics material and a method for the manufacture thereof. 4,604,307, Cl. 428-35.000.

Spry, Douglas O., to Eli Lilly and Company. 3-(alkynylalkyloxy) cephalosporins. 4,604,386, Cl. 514-200.000.

Spyra, Wolfgang: *See—*
Brandis, Helmut; and Spyra, Wolfgang, 4,604,147, Cl. 148-102.000.

Staats, Gotthard; and Thome, Horst, to Aktien-Gesellschaft der Dillinger Huttenwereke. Method of and vessel for removing samples from a bath of molten metal. 4,603,590, Cl. 73-864.580.

Stacey, John, to United Kingdom Atomic Energy Authority. Heat exchanger tube repair. 4,604,512, Cl. 219-85.00M.

Stacher, George W., to Rockwell International Corporation. Super plastic forming method with heat treated seals. 4,603,808, Cl. 228-265.000.

Stahl, G. Allan: *See—*
Irvin, Howard B.; Stahl, G. Allan; and Clark, Earl, 4,604,216, Cl. 252-8.510.

Stahl, Glenn L.: *See—*
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,604,237, Cl. 530-307.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,604,238, Cl. 530-307.000.

Stal-Laval Turbin AB: *See—*
Henriksson, Erik A., 4,604,050, Cl. 431-121.000.

Standard Oil Company, The: *See—*
Burrington, James D.; Grasselli, Robert K.; and Kartisek, Craig T., 4,604,244, Cl. 558-320.000.

Standex International Corporation: *See—*
Black, John W., 4,604,045, Cl. 425-575.000.

Stanley, Gerald R., to Crown International, Inc. Oscillator having a sixteen bit signal generation utilizing an eight bit processor. 4,604,719, Cl. 364-721.000.

Stanton, James H., to Diversey Wyandotte Corporation. Alpha olefin sulfonates as conveyor lubricants. 4,604,220, Cl. 252-33.400.

Staplin, Theodore R., Jr.; Bradley, John J.; and Stoffers, Brian L., to Honeywell Information Systems Inc. Decimal arithmetic logic unit for doubling or complementing decimal operand. 4,604,722, Cl. 364-736.000.

Stauffer Chemical Company: *See—*
Anzenberger, Joseph F., Sr., 4,604,227, Cl. 252-389.200.
Goswami, Jagadish C.; Aurichio, Joseph A.; and Zingaro, Joseph R., 4,604,230, Cl. 252-514.000.
Walsh, Edward N., 4,604,330, Cl. 429-13.000.

Steer, Peter L., to Craig Medical Products, Limited. Tap or valve. 4,603,837, Cl. 251-352.000.

Steinbrenner, Ulrich: *See—*
Bertsch, Richard; Gunther, Dieter; Schmurle, Hans; and Steinbrenner, Ulrich, 4,603,670, Cl. 123-440.000.

Steinebrunner, Walter: *See—*
Dorflinger, Benno; and Steinebrunner, Walter, 4,603,913, Cl. 300-7.000.

Steiner, G. Lewis: *See—*
Brown, Richard P.; Lemay, Richard A.; Steiner, G. Lewis; and Woods, William E., 4,604,685, Cl. 364-200.000.

Stepanov, Boris A.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Sterling Drug Inc.: *See—*
Lesher, George Y.; and Singh, Baldev, 4,604,399, Cl. 514-300.000.

Sterling, Edward L., Jr.; and Bastijanic, Edward, to Babcock & Wilcox Company, The. Voltage pulse to current regulating convertor. 4,604,566, Cl. 323-275.000.

Stern, Leif E. Coupling device for connecting a material outlet to a packing. 4,603,793, Cl. 222-105.000.

Stevens, John K. Alphanumeric display modules. 4,603,495, Cl. 40-451.000.

Stewart, John M., to Sanitation Equipment Limited. Toilet with sight gauge. 4,603,443, Cl. 4-314.000.

Steyr-Daimler-Puch AG: *See—*
Rollenitz, Leopold; Schmidt, Harald; Freudenschuss, Otto; and Morell, Josef, 4,603,811, Cl. 239-90.000.

Stiefel, Edward I.: *See—*
Edelson, Edward H.; Stiefel, Edward I.; Chianelli, Russell R.; and Coyle, Catherine L., 4,604,183, Cl. 208-420.000.

Stigler, Anton. Process for the production of a profile from dry powder material along with a contrivance for this purpose. 4,604,252, Cl. 264-120.000.

Stikvoort, Eduard F., to U.S. Philips Corporation. Interpolating filter arrangement with non-rational ratio between the input and the output sampling frequencies. 4,604,720, Cl. 364-724.000.

Stoesser, Paul R.; Cuzic, John E.; and McLaren, John W., to Dow Chemical Company, The. Foam-generating pump sprayer. 4,603,812, Cl. 239-329.000.

Stoffers, Brian L.: *See—*
Staplin, Theodore R., Jr.; Bradley, John J.; and Stoffers, Brian L., 4,604,722, Cl. 364-736.000.

Stoltz, John W., to Gearhart Industries, Inc. Side entry sub with tension release wireline cable clamp. 4,603,578, Cl. 73-151.000.

Stout, Garry A.; and Perry, Leroy A., to Emhart Industries, Inc. Timer blade arrangement. 4,604,504, Cl. 200-38.00B.

Strain, Robert J., to Fairchild Semiconductor Corporation. Method for making a CMOS circuit having a reduced tendency to latch by controlling the band-gap of source and drain regions. 4,603,471, Cl. 29-576.00B.

Stranahan, Michael: *See—*
Lew, Hyok S.; and Stranahan, Michael, 4,603,519, Cl. 52-81.000.
Lew, Hyok S.; and Stranahan, Michael, 4,603,595, Cl. 74-191.000.

Strandell, Erik: *See—*
Bergkvist, Bruno; Kolhi, Martti; Strandell, Erik; and Svemar, Christer, 4,604,136, Cl. 75-24.000.

Strassmeir, Maximilian E. F. Cylinder lock embodying at least two rows of tumbler pin bores and opposed rows of locking pins which interact to preclude picking. 4,603,565, Cl. 70-358.000.

Strauss, Gottfried, to Glasstemp of Toledo, Inc. Apparatus for manufacturing of tempered, bent glass sheets. 4,604,124, Cl. 65-273.000.

Streichenberger, Gilles: *See—*
Cornu, Pierre-Jean; Perrin, Claude; Dumaitre, Bernard; and Streichenberger, Gilles, 4,604,393, Cl. 514-229.000.

Strenkowski, John G.; and Yang, John P., to Lockheed Electronics Company, Inc. Digital phase correlator. 4,604,582, Cl. 328-55.000.

Stromswold, Chester E., to Sanders Associates, Inc. Acquisition system employing circular array. 4,604,626, Cl. 343-417.000.

Strothmann, Thomas. Level sensing apparatus providing output signals compatible with digital apparatus. 4,603,484, Cl. 33-366.000.

Struck, Joseph W.: *See—*
Loose, Richard D.; and Struck, Joseph W., 4,603,819, Cl. 242-107.40A.

Structural Design Services: *See—*
Watson, John, 4,603,532, Cl. 52-830.000.

Stucki, Felix, to Girsberger Aktiengesellschaft. Control mechanism for an adjustable chair or the like. 4,603,905, Cl. 297-300.000.

Stumpe, Werner: *See—*
Grauel, Ingolf; Kulke, Gunter; Muller, Egbert; and Stumpe, Werner, 4,603,919, Cl. 303-6.00R.

Sturm, Theodor: *See—*
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,604,598, Cl. 335-128.000.

Su, Sophia R.: *See—*
Oblas, Daniel W.; and Su, Sophia R., 4,604,276, Cl. 423-449.000.

Subich, Vadim N.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Sudbeck, Rainer: *See—*
Baumgartner, Hans; Brandstadter, Manfred; and Sudbeck, Rainer, 4,604,040, Cl. 418-55.000.

Suefuji, Kazutaka; Yasuda, Hiromu; Hayashi, Masakatsu; Arata, Tetsuya; Oguni, Kensaku; Kuroda, Shigeaki; Atsumi, Akira; Ishibane, Kyuhei; Terada, Hirokiyo; Senshu, Takao; and Kogure, Hiroshi, to Hitachi, Ltd. Control method and apparatus for an air conditioner using a heat pump. 4,603,556, Cl. 62-180.000.

Suemitsu, Takashi; and Niriki, Takashi, to Pioneer Electronic Corporation. Method of fabricating integrated semiconductor circuit. 4,603,473, Cl. 29-578.000.

Suganuma, Saburo; and Kataoka, Hiroyuki, to Fuji Xerox Co., Ltd. Document issuing apparatus for printing a set of transaction control slips for each of many transactions. 4,604,696, Cl. 364-401.000.

Suganuma, Tsuneo: *See—*
Matsumura, Hiroyoshi; Katsuyama, Toshio; Ohta, Norio; Suganuma, Tsuneo; Nagatsuma, Kazuyuki; and Sugita, Yutaka, 4,604,577, Cl. 324-244.000.

Sugawara, Toyokazu: *See—*
Kitsukawa, Tomohiko; Kusano, Hiroshi; Miyata, Eiji; and Sugawara, Toyokazu, 4,604,483, Cl. 562-443.000.

Sugaya, Yoshio: *See—*
Miyake, Haruhisa; Suhara, Manabu; Sugaya, Yoshio; and Horie, Hirofumi, 4,604,170, Cl. 204-98.000.

Sugihara, Toshihiko, to Kyoritsu Kikai Co., Ltd. Shutter. 4,603,723, Cl. 160-35.000.

Sugimoto, Tadao; Ikeda, Hideo; Mifune, Hiroyuki; and Nakamura, Koki, to Fuji Photo Film Co., Ltd. Method of developing silver halide photographic light-sensitive material. 4,604,339, Cl. 430-244.000.

Sugino, Eiichi: *See—*
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; Sugino, Eiichi; and Mutai, Masahiko, 4,604,463, Cl. 544-125.000.

Sugino, Hiromu: *See—*
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,604,284, Cl. 424-85.000.

Sugita, Yutaka: *See—*
Matsumura, Hiroyoshi; Katsuyama, Toshio; Ohta, Norio; Suganuma, Tsuneo; Nagatsuma, Kazuyuki; and Sugita, Yutaka, 4,604,577, Cl. 324-244.000.

Sugiura, Satoshi; Mitomi, Mitchio; and Suzuki, Hirokazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Nuclear magnetic resonance diagnostic apparatus. 4,604,580, Cl. 324-311.000.

Sugiyama, Kenji: *See—*
Miyazaki, Takeshi; and Sugiyama, Kenji, 4,603,891, Cl. 285-205.000.

Suhara, Manabu: *See—*
Miyake, Haruhisa; Suhara, Manabu; Sugaya, Yoshio; and Horie, Hirofumi, 4,604,170, Cl. 204-98.000.

Suits, Bevan D. Convertible furniture apparatus. 4,603,444, Cl. 5-431.000.

Sullivan, Joseph M.: *See—*
Alley, Robert P.; Huber, Paul G.; and Sullivan, Joseph M., 4,604,552, Cl. 315-176.000.

Sullivan, Richard A., to Envirex Inc. Staged anaerobic reactor. 4,604,206, Cl. 210-603.000.

Sulzer Brothers Limited: *See—*
Tiefenthaler, Edelbert, 4,603,710, Cl. 137-514.700.

Sumitomo Chemical Company, Limited: *See—*
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Futagami, Mikio, 4,604,414, Cl. 524-139.000.
Mitsuno, Tatsuyuki; Koyama, Teruhisa; and Ikezawa, Yuji, 4,604,421, Cl. 524-449.000.
Mori, Kenji; Takematsu, Tetsuo; Sakakibara, Masayuki; and Oshio, Hiromichi, 4,604,240, Cl. 540-114.000.
Oi, Naobumi; Doi, Tadashi; and Nagase, Masayuki, 4,604,207, Cl. 210-635.000.

Sumitomo Electric Industries Ltd.: *See—*
Ito, Mitsuru, 4,603,930, Cl. 339-17.00R.
Kohno, Teruhisa, 4,603,917, Cl. 303-6.00C.
Okoshi, Takanori, 4,603,943, Cl. 350-96.300.
Yamada, Katsuhiko, 4,604,137, Cl. 75-49.000.

Sumitomo Metal Industries, Ltd.: *See—*
Aida, Akira; Ohno, Tetsu; Fukuda, Takashi; Aihara, Kenji; Mizoguchi, Takuo; Nishimura, Syozi; and Kajiyama, Katsuyoshi, 4,604,146, Cl. 148-12.00B.
Kanabara, Susumu; and Aihara, Kenji, 4,604,145, Cl. 148-12.00B.

Sumitomo Metal Mining Company Limited: *See—*
Huang, Yen-Ching; and Nikaido, Hideyasu, 4,604,291, Cl. 427-37.000.

Sun, Shao-Tang: *See—*
Lukach, Carl; and Sun, Shao-Tang, 4,604,217, Cl. 252-8.55R.

Sunbeam Plastics Corp.: *See—*
Gach, Peter P., 4,603,785, Cl. 215-230.000.

Sundstrand Corporation: *See—*
Chetty, P. R. K., 4,604,567, Cl. 323-299.000.
Grimm, Duane H., 4,603,594, Cl. 74-89.150.
Niggemann, Richard E., 4,603,732, Cl. 165-41.000.

Sundstrand Data Control, Inc.: *See—*
Benn, George; Frost, Wendell; Knudsen, Chris; and Nieuwsma, David, 4,604,711, Cl. 364-900.000.

Suomen Sokeri Oy: *See—*
Yoritomi, Kenzaburo, 4,604,199, Cl. 210-293.000.

Surdi, Jean M., to S.N.E.C.M.A. Device for locking a turbine blade to a rotor disk. 4,604,033, Cl. 416-220.00R.

Suresh, Bindinganavle R.: *See—*
Aggarwal, Raj; and Suresh, Bindinganavle R., 4,604,738, Cl. 367-135.000.

Suter, Max, to Omega Electronics S.A. Device for the electromagnetic transmission of an event taking place in an interference-laden environment. 4,604,621, Cl. 340-825.690.

Sutou, Masatsune; and Uneyama, Yoshihisa, to Hitachi, Ltd. Torque control apparatus for enclosed compressors. 4,604,036, Cl. 417-18.000.

Sutterlin, Dieter: *See—*
Walt, Hans; and Sutterlin, Dieter, 4,604,255, Cl. 264-273.000.

Suvorov, Alexandr V.: *See—*
Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., 4,604,724, Cl. 364-478.000.

Suyama, Tadakazu: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,604,385, Cl. 514-183.000.

Suyama, Toshio: *See—*
Yamamoto, Masahiko; Nishino, Yoshinori; Uda, Tadayoshi; Sonoda, Yoshiteru; and Suyama, Toshio, 4,604,254, Cl. 264-254.000.

Suzukawa, Yuichi; Kobayashi, Waichi; and Ohtaka, Satoshi, to Ube Industries, Ltd. Demolition facilitating agent. 4,604,143, Cl. 106-89.000.

Suzuki, Go; and Michisita, Kazuo, to NGK Insulators, Ltd. Ceramic structural body and a method of manufacturing the same. 4,604,677, Cl. 361-393.000.

Suzuki, Hirokazu: *See*—
Sugiura, Satoshi; Mitomi, Mitchio; and Suzuki, Hirokazu, 4,604,580, Cl. 324-311.000.

Suzuki, Ikuo; and Oda, Yukio, to Toyoda Koki Kabushiki Kaisha. Method of grinding a workpiece having a cylindrical portion and shoulder portions. 4,603,514, Cl. 51-281.00C.

Suzuki, Keisuke: *See*—
Tsuchihashi, Genichi; and Suzuki, Keisuke, 4,604,486, Cl. 568-322.000.

Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Switch state detecting apparatus for a camera. 4,603,957, Cl. 354-410.000.

Suzuki, Takaya: *See*—
Kobayashi, Yutaka; Fukami, Akira; and Suzuki, Takaya, 4,604,159, Cl. 156-617.00R.

Suzuki, Yasuhito: *See*—
Tsuji, Shinsaku; Kimura, Toshimitsu; Asano, Yasushi; and Suzuki, Yasuhito, 4,603,598, Cl. 74-473.00P.

Suzuki, Yoshiharu: *See*—
Akiba, Osamu; Suzuki, Yoshiharu; Terada, Motoharu; and Saeki, Takashi, 4,604,618, Cl. 340-825.060.

Svemar, Christer: *See*—
Bergkvist, Bruno; Kolhi, Martti; Strandell, Erik; and Svemar, Christer, 4,604,136, Cl. 75-24.000.

Svistunov, Vladmir E.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Swales, Barton L. Disk blade scraper. 4,603,746, Cl. 172-559.000.

Swapp, Mavin: *See*—
Littlebury, Hugh; and Swapp, Mavin, 4,604,744, Cl. 371-20.000.

Sweany, Louis P., to Emhart Industries, Inc. Audio signalling device. 4,604,606, Cl. 340-384.00E.

Swistak, Gregory B., to Xerox Corporation. Photoreceptor charging scorotron. 4,603,964, Cl. 355-14.0CH.

Switall, Thomas G., to Ryco Graphic Manufacturing, Inc. Liquid applicator for a printing press. 4,603,655, Cl. 118-302.000.

Switches, Inc.: *See*—
Gebhardt, Wallace E., 4,604,506, Cl. 200-61.890.

Swoboda, Johann: *See*—
Hambrecht, Juergen; Illers, Karl-Heinz; Echte, Adolf; and Swoboda, Johann, 4,604,415, Cl. 524-140.000.

Sybenga, John R. Professional stereoscopic projection. 4,603,952, Cl. 352-65.000.

Sychev, Alexel E.: *See*—
Naumov, Jury I.; Juzefovich, Dmitry K.; Epifanova, Valentina S.; Kucherenko, Vladimir I.; Flerov, Valery N.; Praporov, Anatoly M.; Shustov, Vladimir P.; Sychev, Alexel E.; Korolev, Georgy V.; Kotov, Evgeny P.; and Derevyanko, Yan N., 4,604,175, Cl. 204-151.000.

Szabo, Zsolt: *See*—
Benko, Eva; Csabanko, Istvan; Porkolab, Aniko ; Szabo, Zsolt; and Takacs, Gabor, 4,604,086, Cl. 494-16.000.

Tadokoro, Hideki: *See*—
Ikada, Yoshito; Gen, Shokyu; Shimizu, Yasuhiko; Tamura, Koichi; Nakamura, Tatsuo; Kimura, Sosuke; Cho, Tsuneo; Tadokoro, Hideki; and Hori, Kazuaki, 4,603,695, Cl. 128-334.00R.

Taforo, Terrance A.: *See*—
Fernandes, Pete M.; and Taforo, Terrance A., 4,604,377, Cl. 514-8.000.

Taga, Yukio: *See*—
Morishita, Satoru; Shindo, Kenzi; Tozawa, Isao; and Taga, Yukio, 4,604,372, Cl. 502-62.000.

Taguchi, Michihiro, to Sanshin Kogyo Kabushiki Kaisha. Exhaust silencer structure for outboard engines. 4,604,069, Cl. 440-88.000.

Tai, Henry T.: *See*—
Brown, Eric W.; and Tai, Henry T., 4,604,093, Cl. 604-248.000.

Takacs, Gabor: *See*—
Benko, Eva; Csabanko, Istvan; Porkolab, Aniko ; Szabo, Zsolt; and Takacs, Gabor, 4,604,086, Cl. 494-16.000.

Takada, Hiroshi, to Murata Kikai Kabushiki Kaisha. Lifting device for a heddle frame. 4,603,713, Cl. 139-82.000.

Takahashi, Masahiro: *See*—
Hamada, Takuji; Takahashi, Masahiro; and Mizokawa, Sadao, 4,604,742, Cl. 370-89.000.

Takahashi, Mikio: *See*—
Moribe, Yoshihiro; Ohkubo, Nobukuni; Takahashi, Mikio; and Nakagoshi, Kazuo, 4,604,663, Cl. 360-73.000.

Takahashi, Saburo, to Mitsubishi Jukogyo Kabushiki Kaisha. Pipe coupling joint. 4,603,893, Cl. 285-342.000.

Takahashi, Yasushi: *See*—
Takasaki, Yoshitaka; Yamashita, Kiichi; and Takahashi, Yasushi, 4,604,745, Cl. 371-22.000.

Takahr*a, Hisatoshi, to Nippon Kogaku K. K. Photographic information generating apparatus for camera. 4,603,959, Cl. 354-420.000.

Takaishi, Naotake: *See*—
Fujikura, Yoshiaki; Kajihara, Yasushi; Takaishi, Naotake; Inamoto, Yoshiaki; Kimura, Akio; Nakajima, Motoki; and Miyamoto, Norioki, 4,604,488, Cl. 568-820.000.

Takaki, Shoji: *See*—
Ohmori, Akira; Takaki, Shoji; and Kitahara, Takahiro, 4,604,482, Cl. 560-213.000.

Takakura, Makoto; Kondo, Susumu; and Nogami, Tatsuya, to Nissan Chemical Industries, Ltd. Polymer composition containing an organic metal complex and method for producing a metallized polymer from the polymer composition. 4,604,303, Cl. 427-229.000.

Takamizawa, Minoru; Kobayashi, Taishi; Hayashida, Akira; and Takeda, Yoshihumi, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of an inorganic fiber containing silicon, carbon, boron and nitrogen. 4,604,367, Cl. 501-95.000.

Takano, Saburo, to Kabushiki Kaisha Sanai Estate. Deodorizing apparatus. 4,604,113, Cl. 55-201.000.

Takasago Perfumery Co., Ltd.: *See*—
Kumobayashi, Hidenori; and Akutagawa, Susumu, 4,604,474, Cl. 556-7.000.

Takasaki, Yoshitaka; Yamashita, Kiichi; and Takahashi, Yasushi, to Hitachi, Ltd. Method of searching fault locations in digital transmission line. 4,604,745, Cl. 371-22.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,604,456, Cl. 540-222.000.

Takata, Hiroyuki: *See*—
Sakata, Isao; Nakajima, Susumu; Koshimizu, Koichi; Samejima, Natsuki; Inohara, Kazumi; and Takata, Hiroyuki, 4,604,241, Cl. 540-145.000.

Takatoshi, Ono, to Disco Abrasive Systems, Ltd. Apparatus for cutting a sheet-like member applied to a surface of a semiconductor wafer. 4,603,609, Cl. 82-51.000.

Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Company, Limited. Cephem and cephem compounds. 4,604,456, Cl. 540-222.000.

Takeda Chemical Industries Ltd.: *See*—
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,604,284, Cl. 424-85.000.

Takeda, Kota; and Masuda, Tsugunori, to Kabushiki Kaisha Tamura Seisakusho. Automatic soldering apparatus. 4,603,804, Cl. 228-40.000.

Takeda, Yoshihumi: *See*—
Takamizawa, Minoru; Kobayashi, Taishi; Hayashida, Akira; and Takeda, Yoshihumi, 4,604,367, Cl. 501-95.000.

Takedomi, Toshikatsu: *See*—
Onishi, Ken; Ishida, Masayuki; Shirozu, Masakazu; Takedomi, Toshikatsu; Namekawa, Makoto; and Haikawa, Yukihiko, 4,604,747, Cl. 371-37.000.

Takekoshi, Yoshitaka; and Ushiyama, Shigeyuki, to Fanuc Limited. Optical absolute encoder. 4,604,521, Cl. 250-231.0SE.

Takematsu, Tetsuo: *See*—
Mori, Kenji; Takematsu, Tetsuo; Sakakibara, Masayuki; and Oshio, Hiromichi, 4,604,240, Cl. 540-114.000.

Takemoto, Eiji; Miyaki, Masahiko; Norimatsu, Hideaki; Hobo, Nobuhito; Tsuzuki, Yoshihiko; and Konishi, Yoshimune, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Fuel injection pump having voltage variation compensation. 4,603,669, Cl. 123-357.000.

Takenoya, Hideaki; and Mishima, Fumiyuki, to Janome Sewing Machine Co., Ltd. Attaching device for a platen body in a printer. 4,603,988, Cl. 400-649.000.

Takeuchi, Hiroshi: *See*—
Umemura, Shinichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Shinomura, Ryuichi, 4,604,543, Cl. 310-334.000.

Takeuchi, Norio: *See*—
Murasato, Shigeru; Nakanishi, Yuji; Fujiwara, Kenzou; Takeuchi, Norio; and Horita, Tsuyoshi, 4,604,541, Cl. 310-180.000.

Takeuti, Takikazu: *See*—
Horie, Tuneo; Ozaki, Shiyozi; and Takeuti, Takikazu, 4,604,660, Cl. 360-45.000.

Takoh, Masako: *See*—
Wakabayashi, Shinichi; and Takoh, Masako, 4,604,167, Cl. 204-29.000.

Talley Defense Systems, Inc.: *See*—
Knowlton, Gregory D.; and Pietz, John F., 4,604,151, Cl. 149-35.000.

Talpo, Gianpietro, to SACE S.p.A. Costruzioni Elettromeccaniche. Electric circuit breaker of the type using an arc quenching fluid with pressure self-generating due to the breakdown of the fluid. 4,604,508, Cl. 200-148.00R.

Tamai, Yasuo: *See*—
Aonuma, Masashi; and Tamai, Yasuo, 4,604,296, Cl. 427-57.000.

Tamatani, Masaaki: *See*—
Matsuda, Naotoshi; and Tamatani, Masaaki, 4,604,549, Cl. 313-468.000.

Tamura, Koichi: *See*—
Ikada, Yoshito; Gen, Shokyu; Shimizu, Yasuhiko; Tamura, Koichi; Nakamura, Tatsuo; Kimura, Sosuke; Cho, Tsuneo; Tadokoro, Hideki; and Hori, Kazuaki, 4,603,695, Cl. 128-334.00R.

Tanaka, Hideo: *See*—
Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,604,457, Cl. 540-223.000.

Tanaka, Masahiro; Azuma, Kazufumi; Nate, Kazuo; and Nakatani, Mitsuo, to Hitachi, Ltd. Process for forming an organic thin film. 4,604,294, Cl. 427-53.100.

Tanaka, Masayuki: *See*—
Mashimo, Satoshi; Tanaka, Masayuki; Yamaguchi, Yoshio; and Kinoshita, Takashi, 4,604,081, Cl. 474-205.000.

Tanaka, Mitsuo, to Yanmar Diesel Engine Co., Ltd. Gas-diesel dual fuel engine. 4,603,674, Cl. 123-575.000.

Tanaka, Mitsutoshi: *See*—
Arai, Fuminori; Tanaka, Mitsutoshi; and Katsuyama, Harumi, 4,604,347, Cl. 435-4.000.

Tanaka, Shigeru: *See*—
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, 4,603,753, Cl. 180-131.000.

Tanaka, Yasuhiko: *See*—
Kimura, Yoshiaki; and Tanaka, Yasuhiko, 4,604,633, Cl. 346-140.00R.

Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, to Nissan Motor Company, Limited. Method of controlling continuously variable transmission. 4,603,602, Cl. 74-866.000.

Tandy, John S.: *See*—
Lee, Eldon C.; van Pottelsberghe de la Potterie, Pierre J.; and Tandy, John S., 4,604,290, Cl. 426-533.000.

Tanigawa, Shigeho; Shiina, Shuichi; and Uchida, Kimio, to Hitachi Metals, Inc. Apparatus for producing anisotropic magnets. 4,604,042, Cl. 425-3.000.

Tankersley, Robert W., Jr.: *See*—
Munson, Harry R., Jr.; and Tankersley, Robert W., Jr., 4,604,404, Cl. 514-494.000.

Tarascon, Jean-Marie, to Bell Communications Research, Inc. Mo_6Se_6 solid state electrode for secondary lithium batteries. 4,604,334, Cl. 429-194.000.

Tarbox, John W. Method for handling harness wire. 4,603,476, Cl. 29-863.000.

Tari, Karl; Bommaraju, Tilak V.; and Rader, Charles G., to Occidental Chemical Corporation. Process for preparing diaphragm-deposited activated cathodes. 4,604,301, Cl. 427-123.000.

Tateyama, Masamitsu: *See*—
Nakai, Yoshio; Yamauchi, Katsusuke; Kishimura, Masaaki; and Tateyama, Masamitsu, 4,604,416, Cl. 524-145.000.

Tax, Hans; and Kurz, Herbert, to BETAX Gesellschaft fur Beratung und Entwicklung technischer Anlagen mbH. Device on hoisting machinery for automatic control of the movement of the load carrier. 4,603,783, Cl. 212-132.000.

Taylor, Theodore L.: *See*—
Middleton, Frederic H.; Mollenhoff, David V.; Taylor, Theodore L.; and Vaughn, Thomas N., 4,603,448, Cl. 15-22.00R.

Teac Corporation: *See*—
Kitahara, Toshihiro; and Noda, Yasushi, 4,604,666, Cl. 360-99.000.

Tedd, David C.; and Kennedy, David M., to Thorn EMI Instruments Limited. Multimeters. 4,604,569, Cl. 324-73.00R.

Teepak, Inc.: *See*—
Goldberg, Michael S., 4,604,309, Cl. 428-36.000.
Martinek, Thomas W., 4,604,085, Cl. 493-259.000.

Teledyne Industries, Inc.: *See*—
Fisher, Leo; and Weiser, Atilla, 4,604,058, Cl. 433-127.000.

Telefunken Electronic GmbH: *See*—
Rinderle, Heinz, 4,604,586, Cl. 330-288.000.

Teleplex Corporation: *See*—
Schwan, Herbert A.; and Schwan, Eduard A., 4,604,682, Cl. 364-200.000.

Telex Communications, Inc.: *See*—
Cox, Roger A., 4,604,628, Cl. 343-818.000.

Telspec Limited: *See*—
Spencer, Herbert J. C., 4,603,576, Cl. 73-40.000.

Teng, Lin-nar L., to Research Corporation. Enteric compounds and complexes. 4,604,376, Cl. 514-3.000.

Tennerstedt, M. Richard, to Illinois Tool Works Inc. Tool retention mechanism. 4,604,009, Cl. 409-233.000.

Terada, Hirokiyo: *See*—
Suefuji, Kazutaka; Yasuda, Hiromu; Hayashi, Masakatsu; Arata, Tetsuya; Oguni, Kensaku; Kuroda, Shigeaki; Atsumi, Akira; Ishibane, Kyuhei; Terada, Hirokiyo; Senshu, Takao; and Kogure, Hiroshi, 4,603,556, Cl. 62-180.000.

Terada, Motoharu: *See*—
Akiba, Osamu; Suzuki, Yoshiharu; Terada, Motoharu; and Saeki, Takashi, 4,604,618, Cl. 340-825.060.

Teramachi, Hiroshi. Roller bearing for linear sliding movement. 4,603,922, Cl. 384-44.000.

Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Method for setting conditions in photographic printing. 4,603,969, Cl. 355-77.000.

Terauchi, Kiyoshi, to Sanden Corporation. Scroll type fluid compressor with axial clearance adjusting construction. 4,604,039, Cl. 418-55.000.

Terzian, John, to Raytheon Company. Sorting apparatus. 4,604,726, Cl. 364-900.000.

Tetra Pak International AB: *See*—
Hilmersson, Anders E.; and Andersson, Helge, 4,603,490, Cl. 34-155.000.

Texas Instruments Incorporated: *See*—
Colman, Derek; and Cotton, David R., 4,604,640, Cl. 357-46.000.
Lam, Hon W., 4,603,468, Cl. 29-571.000.
Shah, Ashwin H.; Chatterjee, Pallab K.; Gallia, James D.; and Mahant-Shetti, Shivaling S., 4,604,727, Cl. 365-189.000.

Thadani, Suresh G.; and Merchant, Gulamabbas A., to Halliburton Company. Method and apparatus for deconvolving apparent conductivity measurements in induction well logging. 4,604,581, Cl. 324-339.000.

Thaler, Arnold; and Kin, Lai, to Windmere Corporation. Electric curling iron with selectively lockable rotatable handles. 4,604,514, Cl. 219-225.000.

Thell, Bengt, to Esselte Sanden AB. Method of applying an electrical charge in ink jet printers, and an arrangement for carrying the method. 4,604,630, Cl. 346-1.100.

Therm-O-Disc, Incorporated: *See*—
Place, Donald E., 4,604,603, Cl. 337-394.000.

Thermal Engine Technology: *See*—
Lagow, Ralph J., 4,603,554, Cl. 60-670.000.

Thibault, Blandine; and Thibault, Delphine. Device for fastening flags or the like to their staff or the like avoiding winding thereof. 4,603,652, Cl. 116-174.000.

Thibault, Delphine: *See*—
Thibault, Blandine; and Thibault, Delphine, 4,603,652, Cl. 116-174.000.

Thiele Kaolin Company: *See*—
Shi, Joseph C. S., 4,604,369, Cl. 501-148.000.

Thoene, Mark L.: *See*—
Duffy, Joseph K.; Thoene, Mark L.; and Combs, Cathy M., 4,603,780, Cl. 206-591.000.

Thomas, David S. Joystick control. 4,604,502, Cl. 200-6.00A.

Thomas, Donald E. Sliding dovetail template. 4,603,717, Cl. 144-144.5GT.

Thomas, Michael: *See*—
Neumann, Peter; Thomas, Michael; Weiss, Stefan; and Trauth, Hubert, 4,604,471, Cl. 549-210.000.

Thomas, Robert H., deceased; by Mary A. Thomas, executrix; Hammond, Willis B.; Friedberger, Michael P.; and Archie, William A., to Allied Corporation. Fluorochemical composition for coating soil resistant yarn. 4,604,316, Cl. 428-265.000.

Thomas, William J.: *See*—
Lecinski, Frank H., Jr.; and Thomas, William J., 4,603,786, Cl. 215-318.000.

Thome, Horst: *See*—
Staats, Gotthard; and Thome, Horst, 4,603,590, Cl. 73-864.580.

Thompson, Dennis W., to Thompson, Dennis W. Detection of defects in conveyor belts. 4,603,778, Cl. 198-810.000.

Thompson, Stephen C., to Gould Inc. Broadband radial vibrator transducer with multiple resonant frequencies. 4,604,542, Cl. 310-334.000.

Thomson Components-Mostek Corporation: *See*—
van Tran, Hiep, 4,604,732, Cl. 365-207.000.

Thomson CSF: *See*—
Demeure, Alain, 4,604,736, Cl. 367-123.000.

Thorn EMI Instruments Limited: *See*—
Tedd, David C.; and Kennedy, David M., 4,604,569, Cl. 324-73.00R.

Thorpe, Donald H.; and Knipple, Raymond P., to Occidental Chemical Corporation. Process for metal modified phenolic novolac resin. 4,604,436, Cl. 525-504.000.

Thorpe, Richard W., to General Dynamics, Pomona Division. System for comparing conditions between selected pairs of terminals in test circuit with conditions between like terminal pairs in reference circuit. 4,604,570, Cl. 324-73.00R.

Thyssen Aktiengesellschaft vorm. August Thyssen-Hutte: *See*—
Grosse-Wordemann, Josef; and Luckow, Herbert, 4,604,511, Cl. 219-76.140.

Thyssen Edelstahlwerke AG: *See*—
Brandis, Helmut; and Spyra, Wolfgang, 4,604,147, Cl. 148-102.000.

Thyssen Industrie AG: *See*—
Miller, Luitpold; Knoll, Helmut; and Meins, Juergen, 4,603,640, Cl. 104-282.000.

Thyssen Stahl AG: *See*—
Hoffken, Erich; Florin, Wolfram; and Hammer, Rudolf, 4,604,138, Cl. 75-51.600.

Tiefenthaler, Edelbert, to Sulzer Brothers Limited. Non-return valve. 4,603,710, Cl. 137-514.700.

Tikhonenko, Alexandr S.: *See*—
Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Androsenko, Alexandr P.; Suvorov, Alexandr V.; Khalitov, Boris V.; Palkin, Leonid N.; Gnatchenko, Viktor V.; Makarov, Nikolai P.; Panteleev, Valery A.; Davidenko, Nikolai I.; Shpilevsky, Stanislav K.; Tikhonenko, Alexandr S.; and Romanovsky, Anatoly G., 4,604,724, Cl. 364-478.000.

Timex Corporation: *See*—
Brenk, Fritz, 4,603,978, Cl. 368-317.000.

Tobler, David R.: *See*—
Nichols, Robert A.; and Tobler, David R., 4,603,700, Cl. 128-633.000.

Tocco, Inc.: *See*—
Laughlin, John R.; and Mucha, George M., 4,604,510, Cl. 219-10.430.

Toda, Akitoshi: *See*—
Mimura, Yoshiyuki; and Toda, Akitoshi, 4,604,337, Cl. 430-46.000.

Toda, Gyozo: *See*—
Ishihara, Shosaku; Kuroki, Takashi; Toda, Gyozo; Yasukawa, Akio; and Sakamoto, Tatsuji, 4,604,496, Cl. 174-68.500.

Tokai Electric Wire Company Limited: *See*—
Ito, Mitsuru, 4,603,930, Cl. 339-17.00R.

Tokai University: *See*—
Huang, Yen-Ching; and Nikaido, Hideyasu, 4,604,291, Cl. 427-37.000.

Tokyo-Buhin Kogiyo Co., Ltd.: *See*—
Kajihara, Shoji, 4,603,762, Cl. 188-79.50R.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kinoshita, Hiroyuki, 4,604,639, Cl. 357-23.600.

Konishi, Satoshi, 4,604,641, Cl. 357-59.000.
Matsuda, Naotoshi; and Tamatani, Masaaki, 4,604,549, Cl. 313-468.000.
Miyamoto, Junichi; and Saito, Shinji, 4,604,533, Cl. 307-530.000.
Nakamura, Kunihiko; and Koshiyouji, Takashi, 4,603,849, Cl. 271-186.000.
Sato, Fumitaka, 4,604,748, Cl. 371-38.000.
Shimizu, Makoto, 4,604,653, Cl. 358-256.000.
Sugiura, Satoshi; Mitomi, Mitchio; and Suzuki, Hirokazu, 4,604,580, Cl. 324-311.000.
Yotsumoto, Yoshiharu; Kubota, Katsuhiko; and Sekiba, Toshinobu, 4,604,643, Cl. 357-75.000.

Tolleson, Thomas H.; and Hartzog, Steve B., to Shelby Williams Industries, Inc. Chair with articulated, flexible spring backrest. 4,603,904, Cl. 297-296.000.

Tom, Glenn M., to Hercules Incorporated. Scavengers for the removal of impurities from inert fluids. 4,604,270, Cl. 423-262.000.

Tomita, Kazuo: *See—*
Igarashi, Kohei; and Tomita, Kazuo, 4,604,700, Cl. 364-424.000.

Tomita, Seisuke: *See—*
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, 4,603,722, Cl. 152-209.00R.

Tomita, Tsuneo: *See—*
Koike, Noboru; Kitamura, Hidenari; and Tomita, Tsuneo, 4,603,829, Cl. 248-553.000.

Tomosue, Hiroshi. Shifting device for objects, such as eggs, to be handled. 4,603,772, Cl. 198-424.000.

Tone, Hirosada, to Fujitsu Limited. Address translation buffer control system. 4,604,688, Cl. 364-200.000.

Toray Industries, Inc.: *See—*
Okamoto, Miyoshi; Iijima, Hiromichi; and Miyoshi, Akito, 4,604,320, Cl. 428-290.000.

Toray Silicone Co., Ltd.: *See—*
Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, 4,604,435, Cl. 525-476.000.

Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, to Otsuka Kagaku Kabushiki Kaisha. 2-substituted cephem derivatives and process for preparing the same. 4,604,457, Cl. 540-223.000.

Toro Lira, Guillermo L.; and Jensen, Earl M., to Nanometrics Incorporated. Integrated circuit wafer handling system. 4,604,020, Cl. 414-217.000.

Toutant, Roy T.; and Lozinski, Gerald J., to General Electric Company. Robotic inspection system. 4,604,715, Cl. 364-513.000.

Toyo Boseki Kabushiki Kaisha: *See—*
Kuze, Katsuaki; Matsuyama, Yuziro; Yamaoka, Yoshio; Murashige, Ryuichi; and Makimura, Osamu, 4,604,453, Cl. 528-481.000.

Toyo Kogyo Co., Ltd.: *See—*
Kido, Yoshinobu, 4,603,552, Cl. 60-605.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Morishita, Satoru; Shindo, Kenzi; Tozawa, Isao; and Taga, Yukio, 4,604,372, Cl. 502-62.000.

Toyo Stauffer Chemical Co., Ltd.: *See—*
Tsuchihashi, Genichi; and Suzuki, Keisuke, 4,604,486, Cl. 568-322.000.

Toyoda Gosei Co., Ltd.: *See—*
Iwasa, Tadanobu, 4,603,899, Cl. 296-154.000.
Miyazaki, Takeshi; and Sugiyama, Kenji, 4,603,891, Cl. 285-205.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Inagaki, Syoji; Sanpe, Hideyuki; and Makihara, Norimitsu, 4,604,560, Cl. 318-567.000.
Kawasaki, Hisamitsu; and Kato, Yukio, 4,604,012, Cl. 409-233.000.
Suzuki, Ikuo; and Oda, Yukio, 4,603,514, Cl. 51-281.00C.

Toyota Jidosha Kabushiki Kaisha: *See—*
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,603,596, Cl. 74-336.00R.
Igarashi, Kohei; and Tomita, Kazuo, 4,604,700, Cl. 364-424.000.
Konomi, Toshiaki; Ito, Koji; Nagahori, Yukihiro; and Ito, Akio, 4,604,544, Cl. 310-338.000.
Takemoto, Eiji; Miyaki, Masahiko; Norimatsu, Hideaki; Hobo, Nobuhito; Tsuzuki, Yoshihiko; and Konishi, Yoshimune, 4,603,669, Cl. 123-357.000.

Tozawa, Isao: *See—*
Morishita, Satoru; Shindo, Kenzi; Tozawa, Isao; and Taga, Yukio, 4,604,372, Cl. 502-62.000.

Trasch, Heinz-Friedrich: *See—*
Rothe, Anselm; Knappe, Wolfgang-Reinhold; and Trasch, Heinz-Friedrich, 4,604,264, Cl. 422-56.000.

Trauth, Hubert: *See—*
Neumann, Peter; Thomas, Michael; Weiss, Stefan; and Trauth, Hubert, 4,604,471, Cl. 549-210.000.

Trekoval, Jiri: *See—*
Wichterle, Otto; Trekoval, Jiri; Vacik, Jiri; and Michalek, Jiri, 4,604,440, Cl. 526-327.000.

Trimedia Corporation: *See—*
Eltoukhy, Atef; and Price, Rick C., 4,604,179, Cl. 204-298.000.

TRW Inc.: *See—*
Gray, Joseph H., 4,604,721, Cl. 364-726.000.
Mlinar, Mitchell J.; Louie, Kenneth; and Piotrowski, Wieslaw S., 4,604,590, Cl. 333-1.100.

Tseng, Chi-Ping, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamide inner salts. 4,604,133, Cl. 71-90.000.

Tsubouchi, Toshiyuki: *See—*
Shimizu, Nobuaki; Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,604,492, Cl. 585-360.000.
Shimizu, Nobuaki; Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,604,493, Cl. 585-360.000.

Tsuchihashi, Genichi; and Suzuki, Keisuke, to Toyo Stauffer Chemical Co., Ltd. Method of preparing optically active ketones. 4,604,486, Cl. 568-322.000.

Tsuda, Yoshio: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,604,385, Cl. 514-183.000.

Tsuji, Kiyoshi: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,604,456, Cl. 540-222.000.

Tsuji, Shinsaku; Kimura, Toshimitsu; Asano, Yasushi; and Suzuki, Yasuhito, to Nissan Motor Co., Ltd.; and Fuji Koko Co., Ltd. Shift lever. 4,603,598, Cl. 74-473.00P.

Tsuji, Teruji: *See—*
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,604,460, Cl. 544-90.000.

Tsujita, Yoshio: *See—*
Ide, Junya; Muramatsu, Shigeki; Tsujita, Yoshio; and Kuroda, Masao, 4,604,472, Cl. 549-292.000.

Tsuyama, Yoshito: *See—*
Watanabe, Kazuo; Seki, Hiromi; Yamada, Kenji; and Tsuyama, Yoshito, 4,603,806, Cl. 228-152.000.

Tsuzuki, Yoshihiko: *See—*
Takemoto, Eiji; Miyaki, Masahiko; Norimatsu, Hideaki; Hobo, Nobuhito; Tsuzuki, Yoshihiko; and Konishi, Yoshimune, 4,603,669, Cl. 123-357.000.

Twardowski, Zbylut J.; and Nolph, Karl D., to University of Missouri, Curators of the. Dialysis solutions containing cross-linked gelatin. 4,604,379, Cl. 514-21.000.

Ube Industries, Ltd.: *See—*
Suzukawa, Yuichi; Kobayashi, Waichi; and Ohtaka, Satoshi, 4,604,143, Cl. 106-89.000.

Uchida, Kimio: *See—*
Tanigawa, Shigeho; Shiina, Shuichi; and Uchida, Kimio, 4,604,042, Cl. 425-3.000.

Uda, Tadayoshi: *See—*
Yamamoto, Masahiko; Nishino, Yoshinori; Uda, Tadayoshi; Sonoda, Yoshiteru; and Suyama, Toshio, 4,604,254, Cl. 264-254.000.

Udagawa, Masakazu; Saito, Masaki; Segawa, Shingo; and Noda, Masahiro, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for inhibiting foreign material from being deposited on rear window of a motorcar. 4,603,898, Cl. 296-91.000.

Ueeda, Ryuhei; Fujii, Kiyonobu; and Narukawa, Hiroshi, to Kuraray Company, Ltd. Polypropylene sheet. 4,604,441, Cl. 526-351.000.

Uehara, Makoto; and Mogami, Satoshi, to Nippon Kogaku K. K. Projection lens. 4,603,950, Cl. 350-432.000.

Ueno, Masahito, to Diesel Kiki Co., Ltd. Apparatus for controlling the rotational speed of an internal combustion engine. 4,603,668, Cl. 123-352.000.

Ujiie, Masayuki: *See—*
Harada, Susumu; Shimizu, Kiyoshi; and Ujiie, Masayuki, 4,604,451, Cl. 525-328.200.

Ullenboom, Hermann, to Siemens Aktiengesellschaft. Apparatus and method for the reduction of printing offset in bidirectional printing devices. 4,603,984, Cl. 400-121.000.

Umemura, Shinichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Shinomura, Ryuichi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Multi-element ultrasonic transducer. 4,604,543, Cl. 310-334.000.

Uneyama, Yoshihisa: *See—*
Sutou, Masatsune; and Uneyama, Yoshihisa, 4,604,036, Cl. 417-18.000.

Union Carbide Corporation: *See—*
Cheung, Harry, 4,604,117, Cl. 62-25.000.
Nardi, John C., 4,604,336, Cl. 429-224.000.

Union Oil Company of California: *See—*
Clark, Danford E., 4,604,373, Cl. 502-65.000.
Deering, Roland F., 4,604,019, Cl. 414-187.000.
Moorehead, Eric L., 4,604,371, Cl. 502-60.000.
Ward, John W., 4,604,187, Cl. 208-59.000.

Union Siderurgigue du Nord et de l'Est de la France: *See—*
de Smet, Gabriel, 4,604,327, Cl. 428-594.000.

United Kingdom Atomic Energy Authority: *See—*
Stacey, John, 4,604,512, Cl. 219-85.00M.
Watkins, Roger D.; Gillespie, Arthur B.; Deighton, Michael O.; Pike, Roger B.; and Scott-Kestin, Colin B., 4,604,612, Cl. 340-582.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Cole-Hamilton, David J.; Jones, Anthony C.; and Mullin, John B., 4,604,473, Cl. 556-1.000.

United States of America
Air Force: *See—*
Gilmore, Robert L.; and Lander, George E., 4,603,515, Cl. 51-424.000.
Snide, James A.; and Morrisey, Edward J., 4,603,637, Cl. 102-529.000.
Wootton, Roy E., 4,604,554, Cl. 315-330.000.
Yarman, Binboga S., 4,604,593, Cl. 333-139.000.
Army: *See—*
Franchi, Ernest J., 4,604,608, Cl. 340-540.000.
Wagner, Ross I.; and Grant, Louis R., 4,604,271, Cl. 423-286.000.

Energy: *See—*
Anderson, Robert C., 4,604,148, Cl. 148-132.000.
Aquino, Dolores C.; DaPrato, Philip L.; Gouker, Toby R.; and Knoer, Peter, 4,604,105, Cl. 48-197.00R.
Brown, Thomas D.; Reehl, Douglas P.; and Walbert, Gary F., 4,604,052, Cl. 431-168.000.
Chen, Yok; and Gonzalez, Roberto, 4,604,225, Cl. 252-301.40R.
Fish, Richard H., 4,604,191, Cl. 208-251.00R.
Louis, George A., 4,604,331, Cl. 429-35.000.
Wolbert, Ronald R.; and Jandrasits, Walter G., 4,603,463, Cl. 29-402.070.

Health and Human Services: *See—*
Shook, Daniel R., 4,604,094, Cl. 604-271.000.

Interior: *See—*
Borcherdt, Roger D.; Fletcher, Jon P.; Warrick, Richard E.; Maxwell, Gary L.; Jensen, Edward G.; and Schaack, John V., 4,604,699, Cl. 364-420.000.

National Aeronautics and Space Administration: *See—*
Belew, Robert R., 4,604,038, Cl. 417-475.000.
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., 4,604,181, Cl. 204-298.000.

Navy: *See—*
Ayoub, Peter, 4,603,823, Cl. 244-122.0AE.
Kayser, Eleonore G., 4,604,489, Cl. 568-931.000.
Moroney, William F.; Bartholomew, James C.; Cagle, Clifford M.; and Hughes, Robert E., 4,603,486, Cl. 33-512.000.

U.S. Philips Corporation: *See—*
Bertram, Leo; and Bukoschek, Romuald L., 4,604,539, Cl. 310-80.000.
Frencken, Peter H.; Raven, Johannes G.; and Annegarn, Marcellinus J. J. C., 4,604,651, Cl. 358-140.000.
Gunnarsson, Tord S., 4,604,587, Cl. 331-90.000.
Munnig Schmidt, Robert H., 4,603,968, Cl. 355-75.000.
Schmedemann, Walter, 4,603,845, Cl. 269-323.000.
Stikvoort, Eduard F., 4,604,720, Cl. 364-724.000.
van Koesveld, Jan L.; and Schuil, Roelof E., 4,604,550, Cl. 313-478.000.
Visser, Eelco G., 4,604,670, Cl. 360-127.000.

United States Surgical Corporation: *See—*
Conta, Robert L.; and Wallach, Harvey N., 4,603,693, Cl. 128-305.000.

United Technologies Corporation: *See—*
Posluszny, Thomas; Smith, Kevin D.; and Schlie, Paul W., 4,604,574, Cl. 324-207.000.
Zwicke, Philip E., 4,604,702, Cl. 364-431.020.

United Wire Group: *See—*
Bews, Andrew M., 4,603,653, Cl. 116-209.000.

University of California, The Regents of the: *See—*
Cannon, Clifford R.; and Ortendahl, Douglas A., 4,604,579, Cl. 324-309.000.

University of Dayton: *See—*
Graves, George A., Jr.; and Kumar, Binod, 4,604,097, Cl. 623-11.000.

University of Missouri, Curators of the: *See—*
Twardowski, Zbylut J.; and Nolph, Karl D., 4,604,379, Cl. 514-21.000.

University of Waterloo: *See—*
Wynnyckyj, John R.; Rhodes, Edward; and Marr, Robert, 4,603,660, Cl. 122-379.000.

UOP Inc.: *See—*
Beuhler, Allyson J.; and Wrezel, James A., 4,604,438, Cl. 526-262.000.

Ushiyama, Shigeyuki: *See—*
Takekoshi, Yoshitaka; and Ushiyama, Shigeyuki, 4,604,521, Cl. 250-231.0SE.

USI Agri-Business Company Inc.: *See—*
Peckskamp, Hubert, 4,603,657, Cl. 119-18.000.

Vache, Peter: *See—*
Lechner, Ernst F.; and Vache, Peter, 4,603,457, Cl. 29-33.00F.

Vacik, Jiri: *See—*
Wichterle, Otto; Trekoval, Jiri; Vacik, Jiri; and Michalek, Jiri, 4,604,440, Cl. 526-327.000.

Vahlensieck, Hans-Joachim: *See—*
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,604,476, Cl. 556-401.000.

Valeo: *See—*
Blond, Marcel, 4,603,767, Cl. 192-106.200.

Valeron Corporation: *See—*
Cusack, Robert F., 4,603,482, Cl. 33-169.00R.

Valyi, Emery I., to Canada Cup, Inc. Stack-mold for injection blow molding. 4,604,258, Cl. 264-537.000.

Van Breukelen, Jacobus A. T.; and Westerveld, Theodorus, to Dupral B.V. Device and method for bending corrugated plates. 4,603,572, Cl. 72-385.000.

van der Loo, Carolus H.: *See—*
Rootsaert, Walter J. M.; and van der Loo, Carolus H., 4,604,233, Cl. 252-558.000.

Van Eenam, Donald N., to Monsanto Company. Viscosity modifiers for grafted starch polymer solutions. 4,604,163, Cl. 162-175.000.

van Koesveld, Jan L.; and Schuil, Roelof E., to U.S. Philips Corporation. Display tube with terbium-activated blue-luminescing phosphor screen. 4,604,550, Cl. 313-478.000.

van Pottelsberghe de la Potterie, Pierre J.: *See—*
Lee, Eldon C.; van Pottelsberghe de la Potterie, Pierre J.; and Tandy, John S., 4,604,290, Cl. 426-533.000.

VanSickle, Robert O. Heated windshield wiper assembly. 4,603,451, Cl. 15-250.070.

van Tran, Hiep, to Thomson Components-Mostek Corporation. Power supply dependent voltage reference circuit. 4,604,732, Cl. 365-207.000.

van Weezenbeek, Reijer N. Method for removing sludge or mud from the bottom of a water area. 4,604,000, Cl. 405-52.000.

Varghese, Philip: *See—*
Derbyshire, Francis J.; and Varghese, Philip, 4,604,189, Cl. 208-111.000.

Vasile, Carmine F., to Hazeltine Corporation. Automatically adjustable delay circuit having adjustable diode mesa microstrip delay line. 4,604,591, Cl. 333-18.000.

Vasseur, Jackie; and Vasseur, Roger, to S.A. Atecmi. Method and gripping head for gripping a layer of containers arranged on a plane. 4,603,896, Cl. 294-2.000.

Vasseur, Roger: *See—*
Vasseur, Jackie; and Vasseur, Roger, 4,603,896, Cl. 294-2.000.

Vaughn, Thomas N.: *See—*
Middleton, Frederic H.; Mollenhoff, David V.; Taylor, Theodore L.; and Vaughn, Thomas N., 4,603,448, Cl. 15-22.00R.

VDO Adolf Schindling AG: *See—*
Baeger, Holm; and Preiss, Bernd, 4,603,947, Cl. 350-344.000.

Venturetech Enterprises, Inc.: *See—*
Sigerist, Helmut, 4,603,528, Cl. 52-464.000.

Vercelletto, Antoine, to Enterprise Vercelletto. Prefabricated wall for the construction of houses and buildings. 4,603,527, Cl. 52-410.000.

Vernicolor AG: *See—*
Widmer, Hans R.; and Schmid, Christian, 4,604,308, Cl. 428-35.000.

Vernitron Corporation: *See—*
Hirsch, George, 4,604,558, Cl. 318-436.000.

Vetco Offshore, Inc.: *See—*
Pallini, Joseph W., Jr.; and Rohweller, David J., 4,603,886, Cl. 285-24.000.

Vicory, William A.: *See—*
Kuhl, Jane F.; and Vicory, William A., 4,604,119, Cl. 65-4.210.

Victor Company of Japan, Limited: *See—*
Hibino, Chitoshi; and Kobari, Harukuni, 4,604,658, Cl. 360-36.200.
Kinjo, Hisao, 4,604,667, Cl. 360-100.000.

Videocolor: *See—*
Pons, Claude, 4,604,071, Cl. 445-4.000.

Viglietti, John E., to American Orthodontics Corporation. Cast orthodontic appliance. 4,604,057, Cl. 433-9.000.

Vilona, James J., to Fosse, John S. Easel binder. 4,603,995, Cl. 402-73.000.

Vilotte, Alain; and Jacquart, Alain, to Seprosy Societe Europeenne pour la Transformation des Produits de Synthese. Package with a base and a cover, especially for foodstuffs such as eggs. 4,603,809, Cl. 229-2.5EC.

Virtanen, John T. Rotary-disc test printing easel. 4,603,967, Cl. 355-72.000.

Visser, Eelco G., to U.S. Philips Corporation. Magnetic head. 4,604,670, Cl. 360-127.000.

Vock, Manfred H.: *See—*
Wiegers, Wilhelmus J.; and Vock, Manfred H., 4,604,232, Cl. 252-522.00R.

Voest-Alpine International Corporation: *See—*
Scheurecker, Werner; and Scheinecker, Alois, 4,603,841, Cl. 266-44.000.

Volvo Car B.V.: *See—*
Cruijsen, Hermanus G. M., 4,603,765, Cl. 192-85.00V.

von der Heide, Johann: *See—*
Muller, Rolf; Elsasser, Dieter; von der Heide, Johann; and Papst, Georg, 4,604,665, Cl. 360-97.000.

von Gentzkow, Wolfgang; Hodl, Maximilian; Kleeberg, Wolfgang; and Markert, Helmut, to Siemens Aktiengesellschaft. Printed circuit boards of laminated thermosetting sheets. 4,604,314, Cl. 428-209.000.

Voss, Gunther: *See—*
Zeth, Ulrich; Klose, Heinrich; Voss, Gunther; and Winkler, Peter, 4,603,960, Cl. 354-432.000.

Vought Corporation: *See—*
Carollo, Sammy F.; and Dance, William E., 4,604,649, Cl. 358-111.000.

VSI Corporation: *See—*
Reeves, Derek G., 4,604,010, Cl. 409-233.000.

W. F. Meyers Company, Inc.: *See—*
Fish, Donald D., 4,603,678, Cl. 125-21.000.

W. R. Grace & Co.: *See—*
Roberts, William P.; and Schulz, Leslie A., 4,604,427, Cl. 525-185.000.

Wacker-Chemie GmbH: *See—*
Kratel, Gunter; and Loskot, Stefan, 4,604,272, Cl. 423-343.000.

Wade, Gerald J.: *See—*
Ballinger, Dale O.; Chynoweth, William R.; and Wade, Gerald J., 4,604,669, Cl. 360-113.000.

Wade, James J., to Riker Laboratories, Inc. Piperidine-substituted pyrimidines. 4,604,466, Cl. 544-330.000.

Wagner, Bernd: *See—*
Hundt, Werner; and Wagner, Bernd, 4,603,997, Cl. 403-228.000.

Wagner, James B.: *See—*
Yeaple, Thomas L.; Wagner, James B.; and Hall, Donald H., 4,604,028, Cl. 415-38.000.

Wagner, Ross I.; and Grant, Louis R., to United States of America, Army. Magnesium borohydride diammoniate and triammoniate. 4,604,271, Cl. 423-286.000.

Wajima, Motoyo: *See—*
Murakami, Kanji; Akahoshi, Haruo; Kawamoto, Mineo; Wajima, Motoyo; Matsuda, Yoichi; Kawakubo, Kyoji; Kanechiku, Minoru; Yoshimura, Toyofusa; and Matsunaga, Makoto, 4,604,160, Cl. 156-630.000.

Wakabayashi, Shinichi; and Takoh, Masako, to Shinko Electric Industries Co., Ltd. Silver plating solution and silver plating process and pretreatment solution therefor. 4,604,167, Cl. 204-29.000.

Wakai, Masao: *See—*
Yano, Nobuyuki; Inami, Takashi; Ieki, Mitsuru; and Wakai, Masao, 4,603,460, Cl. 29-157.30V.

Wakatsuki, Goroei: *See—*
Matsutoh, Takushi; Wakatsuki, Goroei; Kitamura, Yoshitaka; and Ishihara, Takeo, 4,603,754, Cl. 180-221.000.

Wakefield, George H., Jr. Security system. 4,604,609, Cl. 340-548.000.

Walbert, Gary F.: *See—*
Brown, Thomas D.; Reehl, Douglas P.; and Walbert, Gary F., 4,604,052, Cl. 431-168.000.

Wall, Arne E.: *See—*
Siwersson, Olle L.; and Wall, Arne E., 4,603,774, Cl. 198-518.000.

Wallach, Harvey N.: *See—*
Conta, Robert L.; and Wallach, Harvey N., 4,603,693, Cl. 128-305.000.

Wallow, Peter, to Rheinmetall GmbH. Form-locking arrangement for projectiles. 4,603,636, Cl. 102-521.000.

Walsh, Edward N., to Stauffer Chemical Company. Fuel cell electrolyte. 4,604,330, Cl. 429-13.000.

Walt, Hans; and Sutterlin, Dieter, to Keller Holding AG. Method for fabricating molded bodies formed at least partially of swelled clay material and apparatus for the performance of the method. 4,604,255, Cl. 264-273.000.

Walter, Berthold: *See—*
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,604,598, Cl. 335-128.000.

Waltz, Ralph H.: *See—*
Newhouse, Daniel L.; Wheeler, Richard G.; and Waltz, Ralph H., 4,604,363, Cl. 436-177.000.

Wan, Chung-Chu; and Brown, Glenn W., to Garrett Corporation, The. Diffusion bonding of mechanically held components by hot isostatic pressure. 4,603,801, Cl. 228-194.000.

Ward, John W., to Union Oil Company of California. Hydrocracking with rare earth-containing Y zeolite compositions. 4,604,187, Cl. 208-59.000.

Ward, Robert. Fragrant scented air filter. 4,604,114, Cl. 55-279.000.

Ward, Terence J., to John Wyeth & Brother Limited. Benzoquinolizine derivatives, and their use as $\alpha_2$adrenoceptor antagonistic agents. 4,604,398, Cl. 514-294.000.

Waring, James P., to Scandpower, Inc. Unicable liquid level sensing system. 4,603,580, Cl. 73-295.000.

Warne, Peter J.: *See—*
Collins, Raymond F.; Ramsden, Christopher A.; Saunders, Libert C.; and Warne, Peter J., 4,604,400, Cl. 514-300.000.

Warner-Lambert Company: *See—*
Elslager, Edward F.; Werbel, Leslie M.; Ortwine, Daniel F.; Worth, Donald F.; Showalter, Howard D. H.; Capps, David B.; Berman, Ellen M.; Gregor, Vlad E.; and Sercel, Anthony D., 4,604,390, Cl. 514-222.000.
Glass, Michael; Hoholick, Joseph; Oppenheimer, Alfred; and Dombroski, Amy, 4,604,287, Cl. 426-5.000.
Glass, Michael; Corsello, Vincent; Orlandi, Daniel A.; and Guzowski, Anthony, 4,604,288, Cl. 426-5.000.
Mich, Thomas F.; Culbertson, Townley P.; and Domagala, John M., 4,604,401, Cl. 514-312.000.

Warrick, Richard E.: *See—*
Borcherdt, Roger D.; Fletcher, Jon P.; Warrick, Richard E.; Maxwell, Gary L.; Jensen, Edward G.; and Schaack, John V., 4,604,699, Cl. 364-420.000.

Warszawski, Bernard; Fauvel, Pierre; and Dupre , Sylvain, to Occidental Chemical Corporation. Fuel cell structures. 4,604,332, Cl. 429-38.000.

Watanabe, Akihide: *See—*
Natori, Tatsuo; Nakae, Hideo; Watanabe, Akihide; and Shimaguchi, Takashi, 4,604,141, Cl. 106-38.350.

Watanabe, Hisashi, to Fujitsu Limited. Semiconductor device and process for producing same. 4,604,495, Cl. 174-52.0FP.

Watanabe, Isao, to Canon Kabushiki Kaisha. Flash device. 4,603,953, Cl. 354-126.000.

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Yourd, Raymond A., III: *See*—
Gruber, Robert J.; Yourd, Raymond A., III; and Koch, Ronald J., 4,604,338, Cl. 430-106.000.

Yuasa, Hitoshi; Matsuno, Mitsuo; and Imai, Hirosuke, to Nippon Oil Company Ltd. High-density liquid fuel. 4,604,490, Cl. 585-21.000.

Yuen, Johnny S. C.: *See*—
Richards, Lawrence D.; and Yuen, Johnny S. C., 4,604,075, Cl. 446-232.000.

Yuyama, Masahiro: *See*—
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Futagami, Mikio, 4,604,414, Cl. 524-139.000.

Zajac, Theodore S., to Zaytran Inc. Rotary actuator. 4,603,616, Cl. 92-33.000.

Zaro, Marvin: *See*—
Willcocks, Reginald; and Zaro, Marvin, 4,604,061, Cl. 434-74.000.

Zavelovich, Joshua; and Hacker, David S., to Amoco Corporation. Photochemical process for the preparation of disilane. 4,604,274, Cl. 204-157.410.

Zavod-Vtuz Pri Moskovskom Avtomobilnom Zavode Imeni I.A. Likhacheva: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vasha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Svistunov, Vladmir E.; Bocharov, Jury A.; and Sergeev, Jury N., 4,603,573, Cl. 72-454.000.

Zaweski, Edward F.; and Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions. 4,604,102, Cl. 44-57.000.

Zaytran Inc.: *See*—
Zajac, Theodore S., 4,603,616, Cl. 92-33.000.

Zeikus, Joseph G.; and Hyun, Hyung-Hwan, to Michigan Biotechnology Institute. Co-culture production of thermostable enzymers and ethanol. 4,604,352, Cl. 435-42.000.

Zeiss Ikon AG: *See*—
Kruehn, Juergen; and Prunbauer, Kurt, 4,603,566, Cl. 70-380.000.

Zeth, Ulrich; Klose, Heinrich; Voss, Gunther; and Winkler, Peter, to Jenoptik Jena G.m.b.H. Method for and apparatus for determining an optimum gradation parameter for developing aerial photographs. 4,603,960, Cl. 354-432.000.

Zimmerman, Terrence K.: *See*—
Blount, Frederick T.; Capowski, Robert S.; Casper, Daniel F.; DelSonno, Lawrence R.; Geller, Robert F.; Kusmiss, Joseph M.; and Zimmerman, Terrence K., 4,604,709, Cl. 364-900.000.

Zimmermann, Kurt: *See*—
Eyermann, Manfred; Kettenacker, Gunter; and Zimmermann, Kurt, 4,604,573, Cl. 324-205.000.

Zingaro, Joseph R.: *See*—
Goswami, Jagadish C.; Aurichio, Joseph A.; and Zingaro, Joseph R., 4,604,230, Cl. 252-514.000.

Zollman, James A.; Kramer, William M.; and Rhoads, James L., to RCA Corporation. Intensified charge coupled image sensor having an improved CCD support. 4,604,519, Cl. 250-213.0VT.

Zorcher, Heinz: *See*—
Heinen, Karl-Heinz; Glitscher, Wolfgang; and Zorcher, Heinz, 4,604,135, Cl. 373-60.000.

Zwicke, Philip E., to United Technologies Corporation. Variable discriminators in electrostatic engine diagnostics. 4,604,702, Cl. 364-431.020.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF AUGUST, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Garth, Geoffrey C. Portable cervical collar. Re. 32,219, Cl. 128-76.00R.

Meinert, Leo L.; and Rymarchyk, Nicholas M., to Pullman Berry Co. Lance mounted spray apparatus. Re. 32,220, Cl. 266-158.000.

Pullman Berry Co.: *See*—
Meinert, Leo L.; and Rymarchyk, Nicholas M., Re. 32,220, Cl. 266-158.000.

Rymarchyk, Nicholas M.: *See*—
Meinert, Leo L.; and Rymarchyk, Nicholas M., Re. 32,220, Cl. 266-158.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Application Art Laboratories Co., Ltd.: *See*—
Morita, Tamao, B1 4,021,891, Cl. 24-303.000.

Barnes Engineering Company: *See*—
Schwarz, Frank, B1 3,631,434, Cl. 340-567.000.

Belanger, Raymond J.: *See*—
John, Phillip M.; Belanger, Raymond J.; and Paikoff, Myron, B1 4,302,440, Cl. 424-35.000.

Finamore, Paul V., to World of Wigs Mfg. Co. Inc. Hairpiece. B1 3,716,065, 8-5-86, Cl. 132-53.000.

John, Phillip M.; Belanger, Raymond J.; and Paikoff, Myron, to Sterling Drug Inc. Easily-swallowed, powder-free and gastric-disintegrable aspirin tablet thinly-coated with hydroxypropyl methylcellulose and aqueous spray-coating preparation thereof. B1 4,302,440, 8-5-86, Cl. 424-35.000.

Lever Brothers Company: *See*—
Stahli, Ernst, B1 4,308,306, Cl. 428-141.000.

Martikainen, Kaarlo, to Oy Wartisila AB. Cylinder lock mechanism. B1 4,351,172, 8-5-86, Cl. 70-366.000.

Morita, Tamao, to Application Art Laboratories Co., Ltd. Magnetic lock closure. B1 4,021,891, 8-5-86, Cl. 24-303.000.

Oy Wartisila AB: *See*—
Martikainen, Kaarlo, B1 4,351,172, Cl. 70-366.000.

Paikoff, Myron: *See*—
John, Phillip M.; Belanger, Raymond J.; and Paikoff, Myron, B1 4,302,440, Cl. 424-35.000.

Schwarz, Frank, to Barnes Engineering Company. Passive intrusion detector. B1 3,631,434, 8-5-86, Cl. 340-567.000.

Stahli, Ernst, to Lever Brothers Company. Fabric conditioning products. B1 4,308,306, 8-5-86, Cl. 428-141.000.

Sterling Drug Inc.: *See*—
John, Phillip M.; Belanger, Raymond J.; and Paikoff, Myron, B1 4,302,440, Cl. 424-35.000.

World of Wigs Mfg. Co. Inc.: *See*—
Finamore, Paul V., B1 3,716,065, Cl. 132-53.000.

LIST OF DESIGN PATENTEES

A.W.Faber-Castell GmbH & Co.: *See*—
Jankewitz, Axel, 285,011, Cl. D28-7.000.

Allibert SA: *See*—
Deconinck, Didier, 284,913, Cl. D6-368.000.

American Commercial, Incorporated: *See*—
Otake, Katsuhiro, 284,922, Cl. D7-9.000.

Augros, Jacques, to J. Augros et Cie Societe Anonyme Francaise. Bottle cap. 284,946, 8-5-86, Cl. D9-435.000.

Bakker, Gys; and van den Toorn, Frans, to Industrial Designers Bussum B.V. Lounge chair. 284,912, 8-5-86, Cl. D6-361.000.

Bates, Bobby L., to Bates R&D, Inc. Jumper cable control box. 284,956, 8-5-86, Cl. D13-5.000.

Bates, Bobby L., to Bates R&D, Inc. Combined jumper cable control box and meter. 284,957, 8-5-86, Cl. D13-5.000.

Bates R&D, Inc.: *See*—
Bates, Bobby L., 284,956, Cl. D13-5.000.
Bates, Bobby L., 284,957, Cl. D13-5.000.

Becquet, Jacqueline: *See*—
Herve, Denis; and Becquet, Jacqueline, 285,001, Cl. D24-21.000.

Berg, Franco, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Electrical cabinet or similar article. 284,959, 8-5-86, Cl. D13-40.000.

Bergdahl, Knut E. Air supply register. 284,996, 8-5-86, Cl. D23-141.000.

Beverly, R. Alan, to Ziatech Corporation. Bracket for electronic equipment. 284,932, 8-5-86, Cl. D8-373.000.

Bisbing, Robert H., to Southco, Inc. Adjustable friction hinge. 284,931, 8-5-86, Cl. D8-327.000.

Bobker, Arlene; and Politzer, Arline. Doll. 284,985, 8-5-86, Cl. D21-175.000.

Bossack, Thomas J.; and Shipos, Louis E., to NCR Corporation. Ribbon cassette or similar article. 284,979, 8-5-86, Cl. D18-22.000.

Bristol-Myers Company: *See*—
Cousins, Michael A., 284,947, Cl. D9-445.000.

Butternut Electronics Co.: *See*—
Newcomb, Donald R., 284,936, Cl. D8-396.000.

Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 285,008, Cl. D26-26.000.

Canter, Stanton J., to Diversified Group, Inc. Point of sale display module. 284,917, 8-5-86, Cl. D6-476.000.

Carlson, Arthur R., to Decor Corporation PTY, LTD, The. Container for food. 284,944, 8-5-86, Cl. D9-425.000.

Carrier Corporation: *See*—
Hoyle, Walter W., 284,997, Cl. D23-141.000.
Hoyle, Walter W., 284,998, Cl. D23-141.000.

Chalmers, Edward L., II; and Everest, David C., III, to Lange International S.A. Ski boot buckle. 284,900, 8-5-86, Cl. D2-314.000.

Chodat, Jean-Pierre, to Fabrique Ebel, Societe Anonyme. Watch band. 284,951, 8-5-86, Cl. D11-4.000.

Clark, Stanley N. Stove. 284,928, 8-5-86, Cl. D7-323.000.

Claydon, Howard F. Support for flexible containers. 285,016, 8-5-86, Cl. D34-6.000.

Coca-Cola Company, The: *See*—
Sandish, George R.; Wischusen, Henry, III; and Nemeskeri, George, 284,939, Cl. D9-346.000.
Sedam, Jason K.; Mueller, Richard J.; Holoubek, Andrew J.; and Crosby, Samuel C., 284,926, Cl. D7-308.000.

Collinder, Knut H., to Ingenjorsfirma Knut Collinder AB. Marker. 284,982, 8-5-86, Cl. D20-40.000.

Co. Pr. A., Spa-Via Giacomo Watt 13: *See*—
Dinand, Pierre, 284,942, Cl. D9-403.000.

Computer Bibles International, Inc.: *See*—
Larkins, Frank D., 284,966, Cl. D14-100.000.

Cousins, Michael A., to Bristol-Myers Company. Aerosol can overcap. 284,947, 8-5-86, Cl. D9-445.000.

Crosby, Samuel C.: *See—*
Sedam, Jason K.; Mueller, Richard J.; Holoubek, Andrew J.; and Crosby, Samuel C., 284,926, Cl. D7-308.000.

Crown Zellerbach Corporation: *See—*
Jackmore, John J., 285,019, Cl. D34-26.000.

Dah Sun Electronics Company, Limited: *See—*
Hung, Danny C. C., 284,976, Cl. D18-2.000.

Dalgety Australia Operations Limited: *See—*
Worthington, William; and Ridings, John R., 284,999, Cl. D23-143.000.

Deason, Max W. Mold for forming swimming pool coping. 284,971, 8-5-86, Cl. D15-136.000.

Deconinck, Didier, to Allibert SA. Arm chair. 284,913, 8-5-86, Cl. D6-368.000.

Decor Corporation PTY, LTD, The: *See—*
Carlson, Arthur R., 284,944, Cl. D9-425.000.

Dent, Nigel A.: *See—*
Jones, Wilfred L.; and Dent, Nigel A., 284,945, Cl. D9-425.000.

DiAmico, John L. Snow remover. 285,015, 8-5-86, Cl. D32-49.000.

Diffrient, Niels, to Hauserman, Inc. Task light. 285,009, 8-5-86, Cl. D26-66.000.

Dinand, Pierre, to Co. Pr. A., Spa-Via Giacomo Watt 13. Bottle of perfume or toilet water. 284,942, 8-5-86, Cl. D9-403.000.

Diversified Group, Inc.: *See—*
Canter, Stanton J., 284,917, Cl. D6-476.000.

Eastman Kodak Company: *See—*
Hansen, David E., 284,973, Cl. D16-6.000.

Ekbladh, Fred V. G.; and Tillander, Hans. Surgeon's scrub sink. 284,995, 8-5-86, Cl. D23-60.000.

Engel, Herman J. Combined fluorescent lamp and electrical adapter therefor. 285,007, 8-5-86, Cl. D26-3.000.

Everest, David C., III: *See—*
Chalmers, Edward L., II; and Everest, David C., III, 284,900, Cl. D2-314.000.

Fabrique Ebel, Societe Anonyme: *See—*
Chodat, Jean-Pierre, 284,951, Cl. D11-4.000.

Fetty, Harold D., to Ross Operating Valve Company. Valve. 284,989, 8-5-86, Cl. D23-19.000.

Figliola, Vincent N. Combined tag and cord for bag containing moisturizing beads or the like. 284,981, 8-5-86, Cl. D20-26.000.

Fortuna, Vincent E.; and MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 284,940, 8-5-86, Cl. D9-349.000.

Fujii, Takashi: *See—*
Higashihara, Toru; Takahashi, Akira; Kiyota, Toru; and Fujii, Takashi, 284,964, Cl. D14-60.000.

Gagne, Guy: *See—*
Moulinie, Raoul M.; and Gagne, Guy, 285,006, Cl. D25-73.000.

Garcia, George L.; and Kopp, Robert G., to Suncast Corporation. Occasional table. 284,919, 8-5-86, Cl. D6-488.000.

General Research of Electronics, Inc.: *See—*
Imazeki, Kazuyoshi, 284,963, Cl. D14-71.000.

Green, David T.; McGarry, Richard A.; and Smith, Graham, to United States Surgical Corporation. Surgical clip applicator. 285,002, 8-5-86, Cl. D24-26.000.

Handy, Mark R. Combined back pack and chair. 284,910, 8-5-86, Cl. D6-336.000.

Hansen, David E., to Eastman Kodak Company. Camera with integral flash unit. 284,973, 8-5-86, Cl. D16-6.000.

Hansen, Ernest E. Dispenser for cards. 284,921, 8-5-86, Cl. D6-515.000.

Hauserman, Inc.: *See—*
Diffrient, Niels, 285,009, Cl. D26-66.000.

Hennic (Proprietary) Limited: *See—*
Loubser, Nicolaas D., 284,955, Cl. D12-98.000.

Herve, Denis; and Becquet, Jacqueline. Measuring and checking console particularly adapted for heart tests. 285,001, 8-5-86, Cl. D24-21.000.

Higashihara, Toru; Takahashi, Akira; Kiyota, Toru; and Fujii, Takashi, to Hitachi, Ltd. Television receiver. 284,964, 8-5-86, Cl. D14-60.000.

Hitachi, Ltd.: *See—*
Higashihara, Toru; Takahashi, Akira; Kiyota, Toru; and Fujii, Takashi, 284,964, Cl. D14-60.000.

Holoubek, Andrew J.: *See—*
Sedam, Jason K.; Mueller, Richard J.; Holoubek, Andrew J.; and Crosby, Samuel C., 284,926, Cl. D7-308.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Watanabe, Masahiro; and Yorozu, Shungo, 284,968, Cl. D15-15.000.

Hong Nin Metal Works Factory Co. Ltd.: *See—*
Lai, Fu Hong, 284,950, Cl. D11-3.000.

Hova, Morty. Telephone. 284,960, 8-5-86, Cl. D14-53.000.

Hova, Morty. Telephone. 284,961, 8-5-86, Cl. D14-53.000.

Hova, Morty. Telephone. 284,962, 8-5-86, Cl. D14-53.000.

Hoyle, Walter W., to Carrier Corporation. Front panel for a room air conditioner. 284,997, 8-5-86, Cl. D23-141.000.

Hoyle, Walter W., to Carrier Corporation. Front panel for a room air conditioner. 284,998, 8-5-86, Cl. D23-141.000.

Hung, Danny C. C., to Dah Sun Electronics Company, Limited. Combined calculator and clipboard. 284,976, 8-5-86, Cl. D18-2.000.

Imazeki, Kazuyoshi, to General Research of Electronics, Inc. Programmable AM/FM scanning radio receiver. 284,963, 8-5-86, Cl. D14-71.000.

Imperial Chemical Industries PLC: *See—*
Jones, Wilfred L.; and Dent, Nigel A., 284,945, Cl. D9-425.000.
Powell, David, 284,988, Cl. D23-17.000.

Industrial Designers Bussum B.V.: *See—*
Bakker, Gys; and van den Toorn, Frans, 284,912, Cl. D6-361.000.

Ingenjorsfirma Knut Collinder AB: *See—*
Collinder, Knut H., 284,982, Cl. D20-40.000.

International Business Machines Corporation: *See—*
Wiseman, John A., 284,967, Cl. D14-113.000.

Italiane, Frank. Environmental-retreat booth. 285,005, 8-5-86, Cl. D25-16.000.

J. Augros et Cie Societe Anonyme Francaise: *See—*
Augros, Jacques, 284,946, Cl. D9-435.000.

Jackmore, John J., to Crown Zellerbach Corporation. Hand truck for displaying a product. 285,019, 8-5-86, Cl. D34-26.000.

Jacobs, Leonard J.; and Riley, Michael J., to Jet Spray Corporation. Beverage dispenser. 284,925, 8-5-86, Cl. D7-308.000.

Jankewitz, Axel, to A.W.Faber-Castell GmbH & Co. Nail polish applicator. 285,011, 8-5-86, Cl. D28-7.000.

Jedwab, Henri: *See—*
Jedwab, Maurice; and Jedwab, Henri, 284,938, Cl. D9-307.000.

Jedwab, Maurice; and Jedwab, Henri. Bottle. 284,938, 8-5-86, Cl. D9-307.000.

Jet Spray Corporation: *See—*
Jacobs, Leonard J.; and Riley, Michael J., 284,925, Cl. D7-308.000.

Joerger, Gerhard E. Lavatory faucet set. 284,992, 8-5-86, Cl. D23-25.000.

Johnson, Robert E. Picture frame. 284,909, 8-5-86, Cl. D6-303.000.

Jones, Wilfred L.; and Dent, Nigel A., to Imperial Chemical Industries PLC. Combined tray and cover. 284,945, 8-5-86, Cl. D9-425.000.

JW Lighting, Inc.: *See—*
Mullins, Jack R., 285,010, Cl. D26-67.000.

Kabushiki Kaisha Buncho: *See—*
Yoshida, Kenkichi, 284,980, Cl. D19-41.000.

Kaneko, Toshiro. Box for cultivating vegetables or the like. 284,953, 8-5-86, Cl. D11-155.000.

Kirk, Alexis, to Somersett Moon Ltd. Belt buckle. 284,905, 8-5-86, Cl. D2-422.000.

Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 284,904, 8-5-86, Cl. D2-405.000.

Kiyota, Toru: *See—*
Higashihara, Toru; Takahashi, Akira; Kiyota, Toru; and Fujii, Takashi, 284,964, Cl. D14-60.000.

Kolich, Robert A., to Quaker Oats Company, The. Camera. 284,972, 8-5-86, Cl. D16-6.000.

Kong, Hung W. Watch frame. 284,949, 8-5-86, Cl. D10-128.000.

Kopp, Robert G.: *See—*
Garcia, George L.; and Kopp, Robert G., 284,919, Cl. D6-488.000.

Kusabuka, Yoshito, to Seiko Epson Corporation. Ink ribbon cartridge. 284,978, 8-5-86, Cl. D18-22.000.

Kwok, Herbert. Combined desktop abacus and electronic calculator. 284,975, 8-5-86, Cl. D18-2.000.

Lai, Fu Hong, to Hong Nin Metal Works Factory Co. Ltd. Watch strap. 284,950, 8-5-86, Cl. D11-3.000.

Lamb, Bernard D. Carbonated beverage vehicle. 284,954, 8-5-86, Cl. D12-83.000.

Lamy, Jean-Pierre, to Lamy Optic Industries, Inc. Sunglasses. 284,974, 8-5-86, Cl. D16-102.000.

Lamy Optic Industries, Inc.: *See—*
Lamy, Jean-Pierre, 284,974, Cl. D16-102.000.

Lange International S.A.: *See—*
Chalmers, Edward L., II; and Everest, David C., III, 284,900, Cl. D2-314.000.

Larkins, Frank D., to Computer Bibles International, Inc. Hand held portable computer in the form of a book. 284,966, 8-5-86, Cl. D14-100.000.

Lemkin, Jack L.; and Zilber, Eugene A., to O. M. Scott & Sons Company, The. Garden sprinkler head. 284,986, 8-5-86, Cl. D23-7.000.

Lemkin, Jack L.; and Zilber, Eugene A., to O. M. Scott & Sons Company, The. Combined garden sprinkler and valve. 284,987, 8-5-86, Cl. D23-7.000.

Lemmeyer, Gary R., to Quaker Oats Company, The. Step stool. 284,911, 8-5-86, Cl. D6-349.000.

Libman Broom Company: *See—*
Libman, Robert J., 284,908, Cl. D4-199.000.

Libman, Robert J., to Libman Broom Company. Broom cap. 284,908, 8-5-86, Cl. D4-199.000.

Lindh, Paul A. Footwear sole. 284,902, 8-5-86, Cl. D2-321.000.

Liu, Lai-Jin. Control for a video game. 284,983, 8-5-86, Cl. D21-48.000.

Loubser, Nicolaas D., to Hennic (Proprietary) Limited. Vehicle body. 284,955, 8-5-86, Cl. D12-98.000.

Maciel, Ronald. Pot and pan scraper. 285,014, 8-5-86, Cl. D32-46.000.

MacLaughlin, Donald N.: *See—*
Fortuna, Vincent E.; and MacLaughlin, Donald N., 284,940, Cl. D9-349.000.

Madl, Alfred W., to Sunbeam Corporation. Whirlpool foot massager. 285,003, 8-5-86, Cl. D24-38.000.

Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 284,924, 8-5-86, Cl. D7-137.000.

Marks, Dwight W. Newspaper rack. 284,916, 8-5-86, Cl. D6-462.000.

Matsumoto, Jun: *See—*
Nakamura, Yuji; and Matsumoto, Jun, 285,013, Cl. D32-8.000.

McBride, William. Table frame. 284,918, 8-5-86, Cl. D6-488.000.

McGarry, Richard A.: *See—*
Green, David T.; McGarry, Richard A.; and Smith, Graham, 285,002, Cl. D24-26.000.

Moulinie, Raoul M.; and Gagne, Guy, to Z-Tech Enterprises Inc. Expansion joint. 285,006, 8-5-86, Cl. D25-73.000.

Mueller, Richard J.: *See—*
Sedam, Jason K.; Mueller, Richard J.; Holoubek, Andrew J.; and Crosby, Samuel C., 284,926, Cl. D7-308.000.

Mullins, Jack R., to JW Lighting, Inc. Lighting fixture. 285,010, 8-5-86, Cl. D26-67.000.
Murphy, Jack J. Shackle. 284,933, 8-5-86, Cl. D8-382.000.
Nakamura, Norio, to Suntron Industrial Co., Ltd. UHF antenna. 284,965, 8-5-86, Cl. D14-86.000.
Nakamura, Yuji; and Matsumoto, Jun, to Tokyo Shibaura Denki Kabushiki Kaisha. Clothes drying machine. 285,013, 8-5-86, Cl. D32-8.000.
NCR Corporation: *See*—
Bossack, Thomas J.; and Shipos, Louis E., 284,979, Cl. D18-22.000.
Nemeskeri, George: *See*—
Sandish, George R.; Wischusen, Henry, III; and Nemeskeri, George, 284,939, Cl. D9-346.000.
Nemschoff Chairs, Inc.: *See*—
Nemschoff, Leonard M.; and Nemschoff, Mark S., 284,914, Cl. D6-375.000.
Nemschoff, Leonard M.; and Nemschoff, Mark S., 284,915, Cl. D6-375.000.
Nemschoff, Leonard M.; and Nemschoff, Mark S., to Nemschoff Chairs, Inc. Chair. 284,914, 8-5-86, Cl. D6-375.000.
Nemschoff, Leonard M.; and Nemschoff, Mark S., to Nemschoff Chairs, Inc. Armchair. 284,915, 8-5-86, Cl. D6-375.000.
Nemschoff, Mark S.: *See*—
Nemschoff, Leonard M.; and Nemschoff, Mark S., 284,914, Cl. D6-375.000.
Nemschoff, Leonard M.; and Nemschoff, Mark S., 284,915, Cl. D6-375.000.
Newcomb, Donald R., to Butternut Electronics Co. Antenna element-boom clamp. 284,936, 8-5-86, Cl. D8-396.000.
Nifco, Inc.: *See*—
Okawa, Toshiya, 284,934, Cl. D8-386.000.
North American Philips Corporation: *See*—
Tsuji, Masao, 284,958, Cl. D13-6.000.
O. M. Scott & Sons Company, The: *See*—
Lemkin, Jack L.; and Zilber, Eugene A., 284,986, Cl. D23-7.000.
Lemkin, Jack L.; and Zilber, Eugene A., 284,987, Cl. D23-7.000.
Ogawa, Iwakichi, to Takara Co., Ltd. Combined wristwatch and toy animal figure. 284,948, 8-5-86, Cl. D10-34.000.
Ogilvie, Kenneth A., to Walker Crosweller & Company Limited. Fluid mixing valve for showers or the like. 284,990, 8-5-86, Cl. D23-19.000.
Ogilvie, Kenneth A., to Walker Crosweller & Company Limited. Mixing valve for showers or the like. 284,991, 8-5-86, Cl. D23-19.000.
Okawa, Toshiya, to Nifco, Inc. Panel fastener or the like. 284,934, 8-5-86, Cl. D8-386.000.
Olovsson, Gunnar. Honing disc. 284,969, 8-5-86, Cl. D15-126.000.
Oneida Ltd.: *See*—
Manderfield, Ellen B., 284,924, Cl. D7-137.000.
Otake, Katsuhiro, to American Commercial, Incorporated. Cup. 284,922, 8-5-86, Cl. D7-9.000.
Politzer, Arline: *See*—
Bobker, Arlene; and Politzer, Arline, 284,985, Cl. D21-175.000.
Porteous, Don D. Jar or the like. 284,941, 8-5-86, Cl. D9-378.000.
Powell, David, to Imperial Chemical Industries PLC. Spray gun. 284,988, 8-5-86, Cl. D23-17.000.
Price Pfister, Inc.: *See*—
Yost, Holly K., 284,993, Cl. D23-25.000.
Quaker Oats Company, The: *See*—
Kolich, Robert A., 284,972, Cl. D16-6.000.
Lemmeyer, Gary R., 284,911, Cl. D6-349.000.
Quinonez, Silvio C. Foldable and convertible creeper. 285,018, 8-5-86, Cl. D34-23.000.
Richards, David B. Ground rod driving hammer. 284,930, 8-5-86, Cl. D8-70.000.
Richter, Ethel V. Yarn holder. 284,906, 8-5-86, Cl. D3-26.000.
Ricks, William M. Earring. 284,952, 8-5-86, Cl. D11-75.000.
Ridings, John R.: *See*—
Worthington, William; and Ridings, John R., 284,999, Cl. D23-143.000.
Riley, Michael J.: *See*—
Jacobs, Leonard J.; and Riley, Michael J., 284,925, Cl. D7-308.000.
Ritman, Joost R. Tumbler or similar article. 284,923, 8-5-86, Cl. D7-14.000.
Rittal-Werk Rudolf Loh GmbH & Co. KG: *See*—
Berg, Franco, 284,959, Cl. D13-40.000.
Rock Tenn: *See*—
Sandish, George R.; Wischusen, Henry, III; and Nemeskeri, George, 284,939, Cl. D9-346.000.
Rose, Barbara A. Carrier for cassette player and cassettes. 284,903, 8-5-86, Cl. D2-383.000.
Ross Operating Valve Company: *See*—
Fetty, Harold D., 284,989, Cl. D23-19.000.
Rothe, Waldemar. Bathtub. 284,994, 8-5-86, Cl. D23-56.000.
Rotpunkt Dr. Anso Zimmerman: *See*—
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Sandish, George R.; Wischusen, Henry, III; and Nemeskeri, George, to Coca-Cola Company, The; and Rock Tenn. Packaging container for food and beverages. 284,939, 8-5-86, Cl. D9-346.000.
Schlosser, Erich J.; and Stephen, James C., to Weber-Stephen Products Co. Outdoor barbecue cooker. 284,929, 8-5-86, Cl. D7-332.000.
Schwartz, Frederic W., to Cable Electric Products, Inc. Nightlight. 285,008, 8-5-86, Cl. D26-26.000.
Sedam, Jason K.; Mueller, Richard J.; Holoubek, Andrew J.; and Crosby, Samuel C., to Coca-Cola Company, The. Beverage dispenser. 284,926, 8-5-86, Cl. D7-308.000.
Seiko Epson Corporation: *See*—
Kusabuka, Yoshito, 284,978, Cl. D18-22.000.
Shaw, Clint. Door knocker. 284,937, 8-5-86, Cl. D8-401.000.
Shaw, Velma M. Planting pot clamp for suspended supports. 284,935, 8-5-86, Cl. D8-394.000.
Shipos, Louis E.: *See*—
Bossack, Thomas J.; and Shipos, Louis E., 284,979, Cl. D18-22.000.
Shippert, Ronald D. Surgical suction instrument. 285,004, 8-5-86, Cl. D24-51.000.
Simmons, Raymond B. Mimeographer. 284,977, 8-5-86, Cl. D18-18.000.
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Southco, Inc.: *See*—
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Stratton, Kent E. X-ray viewer. 285,000, 8-5-86, Cl. D24-2.000.
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Tillander, Hans: *See*—
Ekbladh, Fred V. G.; and Tillander, Hans, 284,995, Cl. D23-60.000.
Tilles, Harvey G. Insole for shoes used in lateral sports. 284,901, 8-5-86, Cl. D2-318.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Nakamura, Yuji; and Matsumoto, Jun, 285,013, Cl. D32-8.000.
Tsuji, Masao, to North American Philips Corporation. Charger base for a battery-operated appliance or the like. 284,958, 8-5-86, Cl. D13-6.000.
Tzanetakos, Christos. Toy dump truck. 284,984, 8-5-86, Cl. D21-134.000.
United States Surgical Corporation: *See*—
Green, David T.; McGarry, Richard A.; and Smith, Graham, 285,002, Cl. D24-26.000.
van den Toorn, Frans: *See*—
Bakker, Gys; and van den Toorn, Frans, 284,912, Cl. D6-361.000.
Van Horn, James. Connecting bracket for furniture. 284,920, 8-5-86, Cl. D6-191.000.
Vercon, Inc.: *See*—
Fortuna, Vincent E.; and MacLaughlin, Donald N., 284,940, Cl. D9-349.000.
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Webinger, George P., 284,943, Cl. D9-416.000.
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Ogilvie, Kenneth A., 284,990, Cl. D23-19.000.
Ogilvie, Kenneth A., 284,991, Cl. D23-19.000.
Watanabe, Masahiro; and Yorozu, Shungo, to Honda Giken Kogyo Kabushiki Kaisha. Lawn tractor. 284,968, 8-5-86, Cl. D15-15.000.
Weber-Stephen Products Co.: *See*—
Schlosser, Erich J.; and Stephen, James C., 284,929, Cl. D7-332.000.
Webinger, George P., to Waldorf Corporation. Microwave cooking carton. 284,943, 8-5-86, Cl. D9-416.000.
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Wolff, Friedrich, 284,970, Cl. D15-132.000.
Wiedeman, James W. Golf carrier. 284,907, 8-5-86, Cl. D3-37.000.
Willis, J. Don. Refuse collecting device. 285,012, 8-5-86, Cl. D30-99.000.
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Sandish, George R.; Wischusen, Henry, III; and Nemeskeri, George, 284,939, Cl. D9-346.000.
Wiseman, John A., to International Business Machines Corporation. Display monitor. 284,967, 8-5-86, Cl. D14-113.000.
Wolff, Friedrich, to Werkzeug GmbH. Hand-drill press stand. 284,970, 8-5-86, Cl. D15-132.000.
Worthington, William; and Ridings, John R., to Dalgety Australia Operations Limited. Evaporative air conditioner. 284,999, 8-5-86, Cl. D23-143.000.
Yorozu, Shungo: *See*—
Watanabe, Masahiro; and Yorozu, Shungo, 284,968, Cl. D15-15.000.
Yoshida, Kenkichi, to Kabushiki Kaisha Buncho. Crayon. 284,980, 8-5-86, Cl. D19-41.000.
Yost, Holly K., to Price Pfister, Inc. Sink faucet. 284,993, 8-5-86, Cl. D23-25.000.
Z-Tech Enterprises Inc.: *See*—
Moulinie, Raoul M.; and Gagne, Guy, 285,006, Cl. D25-73.000.
Zentis, Alfred A.: *See*—
Zentis, Ramon J.; and Zentis, Alfred A., 285,017, Cl. D34-15.000.
Zentis, Ramon J.; and Zentis, Alfred A. Motor propelled golf club cart. 285,017, 8-5-86, Cl. D34-15.000.
Ziatech Corporation: *See*—
Beverly, R. Alan, 284,932, Cl. D8-373.000.
Zilber, Eugene A.: *See*—
Lemkin, Jack L.; and Zilber, Eugene A., 284,986, Cl. D23-7.000.
Lemkin, Jack L.; and Zilber, Eugene A., 284,987, Cl. D23-7.000.
Zimmermann, Anso, to Rotpunkt Dr. Anso Zimmerman. Insulated jug. 284,927, 8-5-86, Cl. D7-317.000.

LIST OF PLANT PATENTEES

Duffett, William E.; and Jessel, Walter H., Jr., to Yoder Brothers, Inc. Carnation plant named Winsome. 5,776, 8-5-86, Cl. 71.000.

Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Deep Luv. 5,777, 8-5-86, Cl. 76.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 5TH DAY OF AUGUST, 1986

AT&T Bell Laboratories: *See*—
O'Connor, Kevin J., H97, Cl. 365-230.000.
Rubinstein, Michael; and Starov, Vladimir, H102, Cl. 430-311.000.

Barditch, Irving F.; and Bowersox, Orville C., to United States of America, Army. Tracking of air mass movement. H110, 8-5-86, Cl. 435-29.000.

Bauer, Kevin T., to United States of America, Army. Trigger mechanism. H107, 8-5-86, Cl. 89-149.000.

Boschert, Eric J.: *See*—
Gardner, Christian S.; and Boschert, Eric J., H109, Cl. 239-129.000.

Bowersox, Orville C.: *See*—
Barditch, Irving F.; and Bowersox, Orville C., H110, Cl. 435-29.000.

Cason, Charles M., III: *See*—
Jones, Robert W.; Cason, Charles M., III; and Perkins, James F., H99, Cl. 372-108.000.

Denton, Medona B., to United States of America, Navy. Apparatus for nebulizing particulate laden samples of lubricating oils. H100, 8-5-86, Cl. 239-133.000.

Donovan, William F.; and Nusca, Michael, to United States of America, Army. Projectile stabilizer. H112, 8-5-86, Cl. 102-501.000.

Everritt, William A.: *See*—
Gould, Paul F.; and Everritt, William A., H105, Cl. 89-1.140.

Flesner, Larry D., to United States of America, Navy. Gallium arsenide material and process evaluation by means of pulsed photoconductance in test devices. H111, 8-5-86, Cl. 324-158.00D.

Fuji Photo Film Co., Ltd.: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Fujita, Shinsaku; Koyama, Koichi; Hara, Hiroshi; and Naito, Hideki, H98, Cl. 430-203.000.

Fujita, Shinsaku: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Fujita, Shinsaku; Koyama, Koichi; Hara, Hiroshi; and Naito, Hideki, H98, Cl. 430-203.000.

Gardner, Christian S.; and Boschert, Eric J., to United States of America, Army. Smoke generator. H109, 8-5-86, Cl. 239-129.000.

Gerlach, Karl, to United States of America, United States. Radar doppler processor using a fast orthogonalization network. H108, 8-5-86, Cl. 343-5.0FT.

Gilbert, Everett E., to United States of America, Army. Novel poly(-vinylazide). H103, 8-5-86, Cl. 525-331.500.

Gilbert, Everett E., to United States of America, Army. Novel energetic sulfate salts and a process for their preparation. H106, 8-5-86, Cl. 149-56.000.

Gould, Paul F.; and Everritt, William A., to United States of America, Navy. Lightweight hydraulically fired minesweeping cutter. H105, 8-5-86, Cl. 89-1.140.

Hara, Hiroshi: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Fujita, Shinsaku; Koyama, Koichi; Hara, Hiroshi; and Naito, Hideki, H98, Cl. 430-203.000.

Hung, James C.; and Hung, Stephen T., to United States of America, Army. Digital resolver compensation technique. H104, 8-5-86, Cl. 340-347.0SY.

Hung, Stephen T.: *See*—
Hung, James C.; and Hung, Stephen T., H104, Cl. 340-347.0SY.

Jones, Robert W.; Cason, Charles M., III; and Perkins, James F., to United States of America, Army. Modular unstable ring resonator with multiple output couplers. H99, 8-5-86, Cl. 372-108.000.

Jessel, Walter H., Jr.: *See*—
Duffett, William E.; and Jessel, Walter H., Jr., 5,776, Cl. 71.000.

Yoder Brothers, Inc.: *See*—
Duffett, William E.; and Jessel, Walter H., Jr., 5,776, Cl. 71.000.
Duffett, William E., 5,777, Cl. 76.000.

Koyama, Koichi: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Fujita, Shinsaku; Koyama, Koichi; Hara, Hiroshi; and Naito, Hideki, H98, Cl. 430-203.000.

Lorch, Daniel L., to United States of America, Navy. Arm restraint system for harness mounting. H115, 8-5-86, Cl. 244-122.00A.

McNeel, William. Waterblock and strain relief for electrical connectors. H113, 8-5-86, Cl. 339-105.000.

Naito, Hideki: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Fujita, Shinsaku; Koyama, Koichi; Hara, Hiroshi; and Naito, Hideki, H98, Cl. 430-203.000.

Nusca, Michael: *See*—
Donovan, William F.; and Nusca, Michael, H112, Cl. 102-501.000.

O'Connor, Kevin J., to AT&T Bell Laboratories. Row-address-decoder-driver circuit. H97, 8-5-86, Cl. 365-230.000.

Perkins, James F.: *See*—
Jones, Robert W.; Cason, Charles M., III; and Perkins, James F., H99, Cl. 372-108.000.

Quintavalle, Richard M., to United States of America, Army. Practice projectile assembly. H114, 8-5-86, Cl. 102-513.000.

Rubinstein, Michael; and Starov, Vladimir, to AT&T Bell Laboratories. Controlling resolution of exposed resist in device lithography. H102, 8-5-86, Cl. 430-311.000.

Sato, Kozo: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Fujita, Shinsaku; Koyama, Koichi; Hara, Hiroshi; and Naito, Hideki, H98, Cl. 430-203.000.

Starov, Vladimir: *See*—
Rubinstein, Michael; and Starov, Vladimir, H102, Cl. 430-311.000.

Taylor, Henry F., to United States of America, America. Intensity modulated light source. H96, 8-5-86, Cl. 332-7.510.

United States of America
America: *See*—
Taylor, Henry F., H96, Cl. 332-7.510.
Army: *See*—
Barditch, Irving F.; and Bowersox, Orville C., H110, Cl. 435-29.000.
Bauer, Kevin T., H107, Cl. 89-149.000.
Donovan, William F.; and Nusca, Michael, H112, Cl. 102-501.000.
Gardner, Christian S.; and Boschert, Eric J., H109, Cl. 239-129.000.
Gilbert, Everett E., H103, Cl. 525-331.500.
Gilbert, Everett E., H106, Cl. 149-56.000.
Hung, James C.; and Hung, Stephen T., H104, Cl. 340-347.0SY.
Jones, Robert W.; Cason, Charles M., III; and Perkins, James F., H99, Cl. 372-108.000.
Quintavalle, Richard M., H114, Cl. 102-513.000.
Walker, Clifford G., H101, Cl. 357-30.000.
Navy: *See*—
Denton, Medona B., H100, Cl. 239-133.000.
Flesner, Larry D., H111, Cl. 324-158.00D.
Gould, Paul F.; and Everritt, William A., H105, Cl. 89-1.140.
Lorch, Daniel L., H115, Cl. 244-122.00A.
United States: *See*—
Gerlach, Karl, H108, Cl. 343-5.0FT.

Walker, Clifford G., to United States of America, Army. Ultraviolet and infrared focal place array. H101, 8-5-86, Cl. 357-30.000.

Yabuki, Yoshiharu; Sato, Kozo; Fujita, Shinsaku; Koyama, Koichi; Hara, Hiroshi; and Naito, Hideki, to Fuji Photo Film Co., Ltd. Heat-developable color photographic material. H98, 8-5-86, Cl. 430-203.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 5, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

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784 4,603,704
786 4,603,705

CLASS 132

41 4,603,706
53 B1 3,716,065

CLASS 134

28 4,604,144

CLASS 136

246 4,604,494

CLASS 137

116 4,603,708
205 4,603,709
514.7 4,603,710
557 4,603,707

CLASS 138

30 4,603,711
137 4,603,712

CLASS 139

82 4,603,713

CLASS 141

383 4,603,714

CLASS 144

1 E 4,603,715
134 A 4,603,716
144.5 GT 4,603,717
208 E 4,603,718
365 4,603,719

CLASS 148

12 B 4,604,145
4,604,146
102 4,604,147
132 4,604,148
153 4,604,149
188 4,604,150

CLASS 149

35 4,604,151

CLASS 152

209 R 4,603,720
4,603,721
4,603,722

CLASS 156

93 4,604,152
235 4,604,153
264 4,604,154
287 4,604,155
294 4,604,156
345 4,604,157
403 4,604,158
617 R 4,604,159
630 4,604,160
645 4,604,161
657 4,604,162

CLASS 160

35 4,603,723
180 4,603,724
243 4,603,725

CLASS 162

175 4,604,163
343 4,604,164

CLASS 164

35 4,603,726
133 4,603,727
237 4,603,728
442 4,603,729

CLASS 165

30 4,603,730
41 4,603,731
4,603,732
4,603,733
67 4,603,734

CLASS 166

68 4,603,735
117.5 4,603,736
241 4,603,737
275 4,603,738
311 4,603,739
319 4,603,740
369 4,603,741
374 4,603,742
382 4,603,743

CLASS 172

25 4,603,744
212 4,603,745
559 4,603,746

CLASS 173

94 4,603,747

CLASS 174

52 FP 4,604,495
68.5 4,604,496
110 F 4,604,497
140 S 4,604,498

CLASS 175

19 4,603,748
250 4,603,749
340 4,603,750
410 4,603,751

CLASS 179

2 DP 4,604,499
18 ES 4,604,500
81 B 4,604,501

CLASS 180

6.4 4,603,752
131 4,603,753

221 4,603,754

CLASS 182

5 4,603,755
178 4,603,756
187 4,603,757
194 4,603,758
234 4,603,759

CLASS 188

73.37 4,603,760
73.45 4,603,761
79.5 R 4,603,762
334 4,603,763

CLASS 192

5 4,603,764
85 V 4,603,765
99 S 4,603,766
106.2 4,603,767

CLASS 193

12 4,603,769

CLASS 198

345 4,603,770
367 4,603,771
369 4,603,768
424 4,603,772
468.2 4,603,773
518 4,603,774
589 4,603,775
778 4,603,776
803.8 4,603,777
810 4,603,778

CLASS 200

6 A 4,604,502
11 TC 4,604,503
38 B 4,604,504
50 B 4,604,505
61.89 4,604,506
144 R 4,604,507
148 R 4,604,508
159 B 4,604,509

CLASS 202

113 4,604,165

CLASS 204

1 T 4,604,166
29 4,604,167
30 4,604,168
34 4,604,169
98 4,604,170
4,604,171
4,604,172
105 R 4,604,173
151 4,604,174
4,604,175
157.41 4,604,274
192 M 4,604,176
244 4,604,177
286 4,604,178
298 4,604,179
4,604,180
4,604,181
403 4,604,182

CLASS 206

426 4,603,779
591 4,603,780

CLASS 208

22 4,604,184
50 4,604,186
56 4,604,185
59 4,604,187
106 4,604,188
111 4,604,189
112 4,604,190
251 R 4,604,191
420 4,604,183

CLASS 209

144 4,604,192
273 4,604,193

CLASS 210

98 4,604,194
131 4,604,195
136 4,604,196
150 4,604,197
198.2 4,604,198
293 4,604,199
314 4,604,200
323.2 4,604,201
409 4,604,202
489 4,604,203
490 4,604,204
497.2 4,604,205
603 4,604,206
635 4,604,207
636 4,604,208
661 4,604,209
690 4,604,210
700 4,604,212
701 4,604,211
735 4,604,213
759 4,604,214
762 4,604,215

CLASS 211

90 4,603,781
153 4,603,782

CLASS 212

132 4,603,783

CLASS 215

11 R 4,603,784
230 4,603,785
318 4,603,786

CLASS 219

10.43 4,604,510
76.14 4,604,511
85 M 4,604,512
121 LA 4,604,513
225 4,604,514
298 4,604,515
379 4,604,516
494 4,604,517
506 4,604,518

CLASS 220

1.5 4,603,787
4,603,788
3.9 4,603,789
219 4,603,790
404 4,603,791

CLASS 221

96 4,603,792

CLASS 222

105 4,603,793
207 4,603,794
262 4,603,795
400.7 4,603,796

CLASS 223

46 4,603,797

CLASS 224

310 4,603,798

CLASS 226

119 4,603,800
171 4,603,799

CLASS 228

1.1 4,603,802
4.5 4,603,803
40 4,603,804
123 4,603,805
152 4,603,806
4,603,807
194 4,603,801
265 4,603,808

CLASS 229

2.5 EC 4,603,809

CLASS 239

1 4,603,810
90 4,603,811
329 4,603,812
399 4,603,813

CLASS 241

30 4,603,814
36 4,603,815
266 4,603,816

CLASS 242

1 4,603,817
35.5 A 4,603,818
107.4 A 4,603,819
118.4 4,603,820

CLASS 244

54 4,603,821
4,603,822
122 AE 4,603,823
134 B 4,603,824

CLASS 248

174 4,603,825
205.1 4,603,826
542 4,603,827
4,603,828
553 4,603,829
575 4,603,830

CLASS 249

144 4,603,831

CLASS 250

213 VT 4,604,519
216 4,604,520
231 SE 4,604,521
264 4,604,522
310 4,604,523
342 4,604,524
363 R 4,604,525
561 4,604,526
578 4,604,527

CLASS 251

30.02 4,603,832
94 4,603,833
121 4,603,834
215 4,603,835
315 4,603,836
352 4,603,837
361 4,603,838

CLASS 252

8.510 4,604,216
8.55 C 4,604,218
8.55 R 4,604,217
25 4,604,219
33.4 4,604,220
51.5 A 4,604,221
62.52 4,604,222
70 4,604,223
91 4,604,224
301.4 R 4,604,225
389 A 4,604,226
389.2 4,604,227
492 4,604,228
510 4,604,229
514 4,604,230
518 4,604,231
522 R 4,604,232
558 4,604,233

CLASS 254

329 4,603,839

CLASS 256

11 4,603,840

CLASS 261

26 4,604,245
71 4,604,246
94 4,604,247

CLASS 264

3.1 4,604,248
29.5 4,604,249
35 4,604,250
40.2 4,604,251
120 4,604,252
211 4,604,253
254 4,604,254
273 4,604,255
501 4,604,256
513 4,604,257
537 4,604,258

CLASS 266

44 4,603,841
4,603,842
158 Re.32,220

CLASS 267

35 4,603,843
118 4,603,844

CLASS 269

323 4,603,845

CLASS 271

2 4,603,846
10 4,603,847
125 4,603,848
186 4,603,849
288 4,603,850

CLASS 272

96 4,603,851
109 4,603,852
113 4,603,853
116 4,603,854
117 4,603,855
131 4,603,856
136 4,603,857
137 4,603,858
142 4,603,859

CLASS 273

1 GD 4,603,860
63 R 4,603,861
183 C 4,603,862
282 4,603,863

CLASS 277

12 4,603,864
4,603,865
152 4,603,866

CLASS 279

3 4,603,867

CLASS 280

7.13 4,603,868
11 4,603,869
18 4,603,870
33.99 C 4,603,871
47.13 B 4,603,872
94 4,603,873
272 4,603,875
402 4,603,874
474 4,603,876
478 A 4,603,878
628 4,603,880
652 4,603,879
675 4,603,881
701 4,603,882
807 4,603,877

CLASS 281

45 4,603,883

CLASS 283

1 A 4,603,884

CLASS 285

18 4,603,885
24 4,603,886
32 4,603,887
55 4,603,888
175 4,603,889
205 4,603,891
239 4,603,890
336 4,603,892
342 4,603,893

CLASS 292

216 4,603,894
295 4,603,895

CLASS 294

2 4,603,896
64.1 4,603,897

CLASS 296

91 4,603,898
154 4,603,899
156 4,603,900
165 4,603,901

CLASS 297

35 4,603,902
250 4,603,903
296 4,603,904
300 4,603,905
440 4,603,906
452 4,603,907

CLASS 298

17 R 4,603,908

CLASS 299

7 4,603,909
13 4,603,910
91 4,603,911

CLASS 300

2 4,603,912
7 4,603,913

CLASS 301

37 P 4,603,914
4,603,915
45 4,603,916

CLASS 303

6 C 4,603,917
4,603,921
6 R 4,603,918
4,603,919
10 4,603,920

CLASS 307

10 R 4,604,528
4,604,529
66 4,604,530
445 4,604,531
490 4,604,532
530 4,604,533
4,604,534
570 4,604,535
603 4,604,536

CLASS 310

68 D 4,604,538
68 R 4,604,537
80 4,604,539
154 4,604,540
180 4,604,541
334 4,604,542
4,604,543
338 4,604,544

CLASS 312

183 4,603,924
196 4,603,925

CLASS 313

105 CM 4,604,545
272 4,604,546
315 4,604,553
413 4,604,547
414 4,604,548
468 4,604,549
478 4,604,550

CLASS 315

4 4,604,551
176 4,604,552
330 4,604,554
383 4,604,555
411 4,604,556

CLASS 318

98 4,604,557
436 4,604,558
563 4,604,559
567 4,604,560
4,604,561
640 4,604,562
786 4,604,563

CLASS 320

2 4,604,564
15 4,604,565

CLASS 323

275 4,604,566
299 4,604,567
315 4,604,568

CLASS 324

73 R 4,604,569
4,604,570
77 A 4,604,571
158 F 4,604,572
205 4,604,573
207 4,604,574
208 4,604,575
4,604,576
244 4,604,577
307 4,604,578
309 4,604,579
311 4,604,580
339 4,604,581

CLASS 328

55 4,604,582

CLASS 329

122 4,604,583

CLASS 330

9 4,604,584
286 4,604,585
288 4,604,586

CLASS 331

90 4,604,587
135 4,604,588

CLASS 332

37 R 4,604,589

CLASS 333

1.1 4,604,590
18 4,604,591
24.1 4,604,592
139 4,604,593
194 4,604,594
196 4,604,595

CLASS 335

14 4,604,596
127 4,604,597
128 4,604,598
230 4,604,599
261 4,604,600

CLASS 337

4,604,601
264 4,604,602
394 4,604,603

CLASS 339

17 C 4,603,926
4,603,927
4,603,929
17 LM 4,603,928
17 R 4,603,930
37 4,603,931
39 4,603,932
75 P 4,603,933
90 R 4,603,934
97 P 4,603,935
143 R 4,603,936

CLASS 340

52 A 4,604,604
365 R 4,604,605
384 E 4,604,606
539 4,604,607
540 4,604,608
548 4,604,609
566 4,604,610
567 B1 3,631,434
576 4,604,611
582 4,604,612
638 4,604,613
728 4,604,614
750 4,604,615
756 4,604,616
805 4,604,617
825.06 4,604,618
825.18 4,604,619
825.52 4,604,620
825.69 4,604,621

CLASS 343

5 PD 4,604,622
6.8 R 4,604,623
361 4,604,624
401 4,604,625
417 4,604,626
786 4,604,627
818 4,604,628
909 4,604,629

CLASS 346

1.1 4,604,630
4,604,631
24 4,604,632
140 R 4,604,633
160 4,604,634
226 4,604,635

CLASS 350

3.72 4,603,938
6.4 4,603,939
96.15 4,603,940
4,603,941
96.24 4,603,942
96.30 4,603,943
252 4,603,944
331 R 4,603,945
4,603,946
344 4,603,947
368 4,603,937
426 4,603,948
432 4,603,949
4,603,950

CLASS 351

156 4,603,951

CLASS 352

65 4,603,952

CLASS 354

126 4,603,953
137 4,603,954
286 4,603,955
298 4,603,956
410 4,603,957
414 4,603,958
420 4,603,959
432 4,603,960

CLASS 355

3 DD 4,603,961
3 R 4,603,962
8 4,603,963
14 CH 4,603,964
38 4,603,965
45 4,603,966
72 4,603,967
75 4,603,968
77 4,603,969
133 4,603,970
4,603,971

CLASS 356

4 4,603,972
5 4,603,973
152 4,603,975
394 4,603,974
402 4,603,976
436 4,603,977

CLASS 357

2 4,604,636
17 4,604,637
23.4 4,604,638
23.6 4,604,639
46 4,604,640
59 4,604,641
70 4,604,642
75 4,604,643
80 4,604,644

CLASS 358

27 4,604,645
28 4,604,646
65 4,604,647
101 4,604,648
111 4,604,649
119 4,604,650
140 4,604,651
213 4,604,652
256 4,604,653
298 4,604,654
343 4,604,655

CLASS 360

10.1 4,604,656
4,604,668
32 4,604,657
36.2 4,604,658
38.1 4,604,659
45 4,604,660
69 4,604,661
73 4,604,663
74.1 4,604,662
97 4,604,664
4,604,665
99 4,604,666

100 4,604,667
113 4,604,669
127 4,604,670
132 4,604,671
137 4,604,672

CLASS 361

38 4,604,673
73 4,604,674
155 4,604,675
309 4,604,676
393 4,604,677
401 4,604,678

CLASS 362

277 4,604,679
293 4,604,680

CLASS 364

183 4,604,681
200 4,604,682
4,604,683
4,604,684
4,604,685
4,604,686
4,604,687
4,604,688
4,604,689
4,604,690
4,604,691
4,604,692
4,604,693
4,604,694
4,604,695
401 4,604,696
414 4,604,697
419 4,604,698
420 4,604,699
424 4,604,700
431.01 4,604,701
431.02 4,604,702
431.07 4,604,703
474 4,604,705
478 4,604,704
4,604,724
484 4,604,713
494 4,604,714
507 4,604,706
513 4,604,715
4,604,716
569 4,604,717
578 4,604,718
721 4,604,719
724 4,604,720
726 4,604,721
736 4,604,722
786 4,604,723
822 4,604,707
900 4,604,708
4,604,709
4,604,710
4,604,711
4,604,712
4,604,725
4,604,726

CLASS 365

189 4,604,727
4,604,728
190 4,604,729
200 4,604,730
203 4,604,731
207 4,604,732

CLASS 367

2 4,604,733
63 4,604,734
93 4,604,735
123 4,604,736
134 4,604,737
135 4,604,738

CLASS 368

317 4,603,978

CLASS 369

45 4,604,739

CLASS 370

27 4,604,740
69.1 4,604,741
85 4,604,743
89 4,604,742

CLASS 371

20 4,604,744
22 4,604,745
25 4,604,746
37 4,604,747
38 4,604,748
4,604,749
4,604,750
4,604,751

CLASS 372

29 4,604,752
36 4,604,753

CLASS 373

60 4,604,135
130 4,604,754

CLASS 374

54 4,603,979
179 4,603,980
210 4,603,981

CLASS 375

98 4,604,755
113 4,604,756

CLASS 383

46 4,604,757

CLASS 384

7 4,603,923
44 4,603,922
129 4,603,982
512 4,603,983

CLASS 400

121 4,603,984
167 4,603,985
241.2 4,603,986
639.1 4,603,987
649 4,603,988

CLASS 401

78 4,603,989
85 4,603,990
86 4,603,991
190 4,603,992
195 4,603,993
209 4,603,994

CLASS 402

73 4,603,995

CLASS 403

7 4,603,996
228 4,603,997
322 4,603,998

CLASS 404

112 4,603,999

CLASS 405

52 4,604,000
224 4,604,001
4,604,002
256 4,604,003

CLASS 407

110 4,604,004

CLASS 408

35 4,604,005
76 4,604,006

CLASS 409

89 4,604,007
138 4,604,011
231 4,604,008
233 4,604,009
4,604,010
4,604,012

CLASS 410

106 4,604,013

CLASS 411

338 4,604,014
537 4,604,015

CLASS 414

7 4,604,016
23 4,604,017
44 4,604,018
187 4,604,019
217 4,604,020
226 4,604,021
340 4,604,022
375 4,604,023
592 4,604,024
698 4,604,025
728 4,604,026
749 4,604,027

CLASS 415

38 4,604,028
92 4,604,029
126 4,604,030

CLASS 416

97 R 4,604,031
128 4,604,032
220 R 4,604,033

CLASS 417

18 4,604,034
4,604,036
319 4,604,035
394 4,604,037
475 4,604,038

CLASS 418

55 4,604,039
4,604,040
82 4,604,041

CLASS 419

2 4,604,260

CLASS 422

50 4,604,263
56 4,604,264
191 4,604,261
310 4,604,262

CLASS 423

49 4,604,265
54 4,604,266
4,604,267
230 4,604,268
242 4,604,269
262 4,604,270
286 4,604,271
343 4,604,272
344 4,604,273
437 4,604,275
449 4,604,276
517 4,604,277
4,604,278
581 4,604,279

CLASS 424

35 B1 4,302,440
49 4,604,280
59 4,604,281
74 4,604,282
80 4,604,283
85 4,604,284
94 4,604,285
149 4,604,286

CLASS 425

3 4,604,042
182 4,604,043
525 4,604,044
575 4,604,045

CLASS 426

5 4,604,287
4,604,288
19 4,604,289
533 4,604,290

CLASS 427

37 4,604,291
39 4,604,292
42 4,604,293
53.1 4,604,294
54.1 4,604,295
57 4,604,296
64 4,604,297
96 4,604,298
98 4,604,299
120 4,604,300
123 4,604,301
208.6 4,604,302
229 4,604,303
255 4,604,304
385.5 4,604,305
423 4,604,306

CLASS 428

35 4,604,307
4,604,308
36 4,604,309
4,604,310
96 4,604,311
137 4,604,312
141 B1 4,308,306
172 4,604,313
209 4,604,314
230 4,604,315
265 4,604,316
285 4,604,317
289 4,604,318
290 4,604,319
4,604,320
319.9 4,604,321
332 4,604,322
336 4,604,323
349 4,604,324
391 4,604,325
398 4,604,326
594 4,604,327
606 4,604,328
620 4,604,329

CLASS 429

13 4,604,330
35 4,604,331
38 4,604,332
94 4,604,333
194 4,604,334
197 4,604,335
224 4,604,336

CLASS 430

46 4,604,337
106 4,604,338
244 4,604,339
270 4,604,340
278 4,604,341
281 4,604,342
4,604,343
325 4,604,344
394 4,604,345

CLASS 431

2 4,604,046
5 4,604,047
8 4,604,048
80 4,604,049
121 4,604,050
166 4,604,051
168 4,604,052
320 4,604,053
328 4,604,054

CLASS 432

58 4,604,055
249 4,604,056

CLASS 433

9 4,604,057
127 4,604,058
217.1 4,604,059
221 4,604,060

CLASS 434

74 4,604,061
88 4,604,062
157 4,604,063
224 4,604,064
331 4,604,065

CLASS 435

1 4,604,346
4 4,604,347
7 4,604,348
15 4,604,349
29 4,604,350
35 4,604,351
42 4,604,352
58 4,604,353
94 4,604,354
95 4,604,355
194 4,604,356
215 4,604,357
217 4,604,358
253 4,604,359
287 4,604,360
288 4,604,361

CLASS 436

34 4,604,362
177 4,604,363
501 4,604,364
528 4,604,365

CLASS 440

7 4,604,066
49 4,604,067
76 4,604,068
88 4,604,069

CLASS 441

70 4,604,070

CLASS 445

4 4,604,071
30 4,604,072

CLASS 446

117 4,604,073
171 4,604,074
232 4,604,075
418 4,604,076

CLASS 464

111 4,604,077

CLASS 474

80 4,604,078
114 4,604,079
153 4,604,080
205 4,604,081
242 4,604,082

CLASS 493

34 4,604,083
226 4,604,084
259 4,604,085

CLASS 494

16 4,604,086

CLASS 501

6 4,604,366
95 4,604,367
98 4,604,368
148 4,604,369

CLASS 502

38 4,604,370
60 4,604,371
62 4,604,372
65 4,604,373
115 4,604,374
241 4,604,375

CLASS 514

2 4,604,234
3 4,604,376
8 4,604,377
11 4,604,378
21 4,604,379
30 4,604,380
34 4,604,381
49 4,604,382
63 4,604,383
179 4,604,384
183 4,604,385
200 4,604,386
206 4,604,387
211 4,604,388
213 4,604,389
222 4,604,390
4,604,391
227 4,604,392
229 4,604,393
255 4,604,394
4,604,395
256 4,604,396
291 4,604,397
294 4,604,398
300 4,604,399
4,604,400
312 4,604,401
333 4,604,402
425 4,604,403
494 4,604,404
526 4,604,405
562 4,604,406
575 4,604,407

CLASS 521

91 4,604,408
157 4,604,409
172 4,604,410

CLASS 522

14 4,604,411

CLASS 523

112 4,604,412
137 4,604,413

CLASS 524

139 4,604,414
140 4,604,415
145 4,604,416
199 4,604,417
296 4,604,418
318 4,604,419
394 4,604,420
449 4,604,421
502 4,604,422
508 4,604,423
862 4,604,424

CLASS 525

88 4,604,425
123 4,604,426
185 4,604,427
276 4,604,428
326.6 4,604,429
326.7 4,604,430
328.2 4,604,451
351 4,604,431
389 4,604,432
411 4,604,433
462 4,604,434
476 4,604,435
504 4,604,436

CLASS 526

189 4,604,447
262 4,604,437
4,604,438
288 4,604,439
327 4,604,440
351 4,604,441

CLASS 528

28 4,604,442
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34 4,604,444
64 4,604,445
173 4,604,446
232 4,604,448
288 4,604,449
322 4,604,450
422 4,604,452
481 4,604,453
491 4,604,454

CLASS 530

307 4,604,236
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317 4,604,239
387 4,604,235

CLASS 534

587 4,604,455

CLASS 540

114 4,604,240
145 4,604,241
222 4,604,456
223 4,604,457

CLASS 544

37 4,604,458
76 4,604,459
90 4,604,460
99 4,604,461
4,604,462
125 4,604,463
237 4,604,464
326 4,604,465
330 4,604,466

CLASS 546

346 4,604,467

CLASS 548

305 4,604,468
432 4,604,469

CLASS 549

81 4,604,470
210 4,604,471
292 4,604,472

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1 4,604,473
7 4,604,474
97 4,604,475
401 4,604,476
436 4,604,477
439 4,604,478
440 4,604,479
445 4,604,480

CLASS 558

260 4,604,242
320 4,604,244
388 4,604,243

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213 4,604,482

CLASS 562

443 4,604,483

CLASS 564

305 4,604,484

CLASS 568

319 4,604,485
322 4,604,486
715 4,604,487
820 4,604,488
931 4,604,489

CLASS 585

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9 4,604,087
24 4,604,088
30 4,604,089
118 4,604,090
246 4,604,092
248 4,604,093
271 4,604,094
323 4,604,095
385 A 4,604,096

CLASS 623

11 4,604,097
60 4,604,098

CLASSIFICATION OF DESIGNS

D2—	314	284,900			284,919		349	284,940	D14—	53	284,960	D19—	41	284,980	D24—	2	285,000
	318	284,901		515	284,921		378	284,941			284,961	D20—	26	284,981		21	285,001
	321	284,902	D7—	9	284,922		403	284,942			284,962		40	284,982		26	285,002
	383	284,903		14	284,923		416	284,943		60	284,964	D21—	48	284,983		38	285,003
	405	284,904		137	284,924		425	284,944		71	284,963		134	284,984		51	285,004
	422	284,905		308	284,925			284,945		86	284,965		175	284,985	D25—	16	285,005
D3—	26	284,906			284,926		435	284,946		100	284,966	D23—	7	284,986		73	285,006
	37	284,907		317	284,927		445	284,947		113	284,967			284,987	D26—	3	285,007
D4—	199	284,908		323	284,928	D10—	34	284,948	D15—	15	284,968		17	284,988		26	285,008
D6—	191	284,920		332	284,929		128	284,949		126	284,969		19	284,989		66	285,009
	303	284,909	D8—	70	284,930	D11—	3	284,950		132	284,970			284,990		67	285,010
	336	284,910		327	284,931		4	284,951		136	284,971			284,991	D28—	7	285,011
	349	284,911		373	284,932		75	284,952	D16—	6	284,972		25	284,992	D30—	99	285,012
	361	284,912		382	284,933		155	284,953			284,973			284,993	D32—	8	285,013
	368	284,913		386	284,934	D12—	83	284,954		102	284,974		56	284,994		46	285,014
	375	284,914		394	284,935		98	284,955	D18—	2	284,975		60	284,995		49	285,015
		284,915		396	284,936	D13—	5	284,956			284,976		141	284,996	D34—	6	285,016
	462	284,916		401	284,937			284,957		18	284,977			284,997		15	285,017
	476	284,917	D9—	307	284,938		6	284,958		22	284,978			284,998		23	285,018
	488	284,918		346	284,939		40	284,959			284,979		143	284,999		26	285,019

CLASSIFICATION OF PLANTS

P.—	71	5,776		76	5,777												

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	513	H114	244—	122 A	H115												

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,603,690	4,603,833	4,604,619	4,604,182	4,603,842	4,604,538
	4,603,718	4,603,834	4,604,623	4,604,217	4,603,865	4,604,604
	4,604,038	4,603,846	4,604,625	4,604,226	4,603,895	4,604,606
	4,604,564	4,603,871	4,604,648	4,604,270	4,603,916	4,604,701
	4,604,592	4,603,872	4,604,672	4,604,311	4,604,009	4,604,719
04 :	4,603,484	4,603,889	4,604,678	4,604,408	4,604,014	19 : 4,603,505
	4,603,702	4,603,929	4,604,682	4,604,447	4,604,016	4,603,900
	4,603,707	4,603,931	4,604,683	4,604,516	4,604,023	4,603,952
	4,603,805	4,603,934	4,604,687	12 : 4,603,459	4,604,025	4,604,013
	4,603,867	4,603,940	4,604,689	4,603,500	4,604,035	4,604,693
	4,603,874	4,603,942	4,604,699	4,603,502	4,604,064	20 : 4,603,513
	4,603,927	4,603,944	4,604,708	4,603,504	4,604,092	4,604,066
	4,604,151	4,603,945	4,604,721	4,603,529	4,604,200	21 : 4,603,716
	4,604,739	4,603,965	08 : 4,603,519	4,603,593	4,604,205	4,604,452
	4,604,744	4,603,973	4,603,595	4,603,686	4,604,211	4,604,518
05 :	4,603,876	4,603,975	4,603,700	4,603,728	4,604,213	4,604,715
06 :	Re.32,219	4,603,995	4,603,712	4,603,881	4,604,236	22 : 4,603,739
	4,603,440	4,604,001	4,603,851	4,603,939	4,604,237	4,603,861
	4,603,461	4,604,019	4,604,058	4,603,949	4,604,238	4,604,002
	4,603,466	4,604,020	4,604,162	4,604,067	4,604,274	4,604,044
	4,603,471	4,604,049	4,604,669	4,604,110	4,604,309	4,604,102
	4,603,476	4,604,062	4,604,686	4,604,499	4,604,335	4,604,190
	4,603,478	4,604,073	4,604,706	4,604,514	4,604,358	4,604,243
	4,603,493	4,604,074	4,604,737	4,604,568	4,604,423	4,604,374
	4,603,507	4,604,076	09 : 4,603,441	4,604,574	4,604,431	4,604,467
	4,603,510	4,604,090	4,603,517	4,604,602	4,604,438	4,604,607
	4,603,522	4,604,093	4,603,569	4,604,674	4,604,481	23 : 4,603,802
	4,603,531	4,604,103	4,603,627	13 : 4,603,755	4,604,509	24 : 4,603,580
	4,603,535	4,604,134	4,603,693	4,603,878	4,604,567	4,603,840
	4,603,553	4,604,179	4,603,777	4,604,119	4,604,627	4,603,888
	4,603,567	4,604,187	4,603,835	4,604,283	4,604,675	4,603,993
	4,603,574	4,604,191	4,603,875	4,604,369	3,716,065	4,604,094
	4,603,587	4,604,250	4,603,935	15 : 4,603,855	18 : 4,603,512	4,604,098
	4,603,591	4,604,263	4,603,989	16 : 4,604,362	4,603,678	4,604,116
	4,603,638	4,604,271	4,604,005	17 : 4,603,501	4,603,679	4,604,365
	4,603,643	4,604,328	4,604,063	4,603,543	4,603,680	4,604,427
	4,603,659	4,604,329	4,604,109	4,603,594	4,603,785	4,604,489
	4,603,664	4,604,359	4,604,174	4,603,605	4,603,902	4,604,650
	4,603,687	4,604,371	4,604,198	4,603,612	4,603,908	4,604,733
	4,603,703	4,604,373	4,604,208	4,603,620	4,603,982	25 : 4,603,469
	4,603,719	4,604,377	4,604,210	4,603,621	4,604,015	4,603,489
	4,603,724	4,604,409	4,604,258	4,603,634	4,604,079	4,603,635
	4,603,730	4,604,430	4,604,290	4,603,642	4,604,085	4,603,681
	4,603,731	4,604,432	4,604,319	4,603,655	4,604,127	4,603,691
	4,603,744	4,604,433	4,604,331	4,603,658	4,604,156	4,603,701
	4,603,748	4,604,501	4,604,382	4,603,661	4,604,239	4,603,727
	4,603,787	4,604,513	4,604,450	4,603,732	4,604,300	4,603,797
	4,603,790	4,604,551	4,604,616	4,603,746	4,604,356	4,603,854
	4,603,798	4,604,559	4,604,702	4,603,780	4,604,380	4,603,879
	4,603,801	4,604,562	4,604,743	4,603,781	4,604,386	4,603,897
	4,603,808	4,604,570	3,631,434	4,603,786	4,604,434	4,604,003
	4,603,827	4,604,579	10 : 4,604,130	4,603,807	4,604,504	4,604,028
	4,603,832	4,604,590	4,604,133	4,603,813	4,604,506	4,604,089

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28 : 4,603,625
29 : 4,603,570
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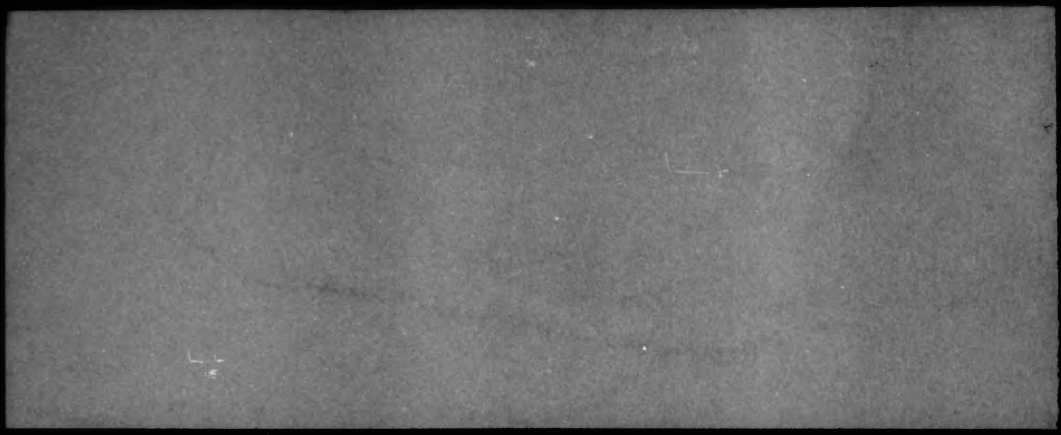

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